Transport and Environment Committee

10.00am, Thursday, 15 June 2023

Medium Term Improvements at Portobello High Street/Inchview Terrace/Sir Harry Lauder Road Junction

Executive/routine	**Executive**
Wards	**14 - Craigentinny/Duddingston** **17 - Portobello/Craigmillar**
Council Commitments	

1. Recommendations

1.1 It is recommended that Transport and Environment Committee:

1.1.1. Notes the work undertaken to develop and evaluate options for medium term improvements to safety for people walking, wheeling and cycling at the junction of Portobello High Street, Inchview Terrace and Sir Harry Lauder Road;

1.1.2. Approves proceeding with the design and implementation of Option 3, as described within the report; and

1.1.3. Notes that longer term improvements will be considered as part of the citywide review of safety at major junctions.

Paul Lawrence

Executive Director of Place

Contact: Daisy Narayanan, Senior Manager – Placemaking and Mobility

E-mail: daisy.narayanan@edinburgh.gov.uk

Report

Medium Term Improvements at Portobello High Street/Inchview Terrace/Sir Harry Lauder Road Junction

2. Executive Summary

2.1 This report sets out the options that have been developed and evaluated for medium term improvements to safety for people walking, wheeling and cycling at the junction (of Portobello High Street/Inchview Terrace/Sir Harry Lauder Road) and seeks approval to proceed with the design and implementation of a preferred option.

3. Background

3.1 On 14 October 2021, Committee approved the implementation of short term improvements to safety for people walking, wheeling and cycling at the junction. Those improvements were implemented in summer 2022 and remain in place.

3.2 Committee has received regular updates on the work to develop more substantive, medium term improvements. Longer term improvements will be considered as part of the citywide review of safety at major junctions, as instructed by Committee on 12 November 2020.

3.3 The purpose of this report is to provide detail on the medium term options and recommend the preferred option to be implemented.

3.4 On 20 April 2023, Committee received an update on the citywide review of safety at major junctions. Longer term improvements for this junction will form part of the next steps of this work.

4. Main report

Short Term Improvements

4.1 As part of the short term improvements, the left turn filter lane from Portobello High Street into Sir Harry Lauder Road is temporarily closed to all traffic and a Temporary Traffic Regulation Order (TTRO) is in place, prohibiting Heavy Good Vehicles (HGVs) from turning left onto Sir Harry Lauder Road. A signed diversion route is in place for this HGV traffic.

4.2 The TTRO is due to expire on 3 October 2023. However, as the TTRO has been promoted because of the likelihood of danger to the public, it is permissible to extend the duration of the TTRO while this danger remains, thereby allowing sufficient time for medium term improvements to be developed and implemented.

4.3 A plan showing the current road layout is provided in Appendix 1.

Medium Term Improvements

4.4 Four options for medium term improvements have been developed. In general, each successive option increases the degree of physical change at the junction and the level of improvement to infrastructure for people walking, wheeling and cycling. All options have been developed with a view to the potential for further changes to be implemented in the future, as part of the citywide review of safety at major junctions.

Option 1 – Do Minimum

4.5 This option would make the minimum changes necessary to the junction to permanently remove the left turn filter lane from Portobello High Street onto Sir Harry Lauder Road and reinstate the left turn onto Sir Harry Lauder Road for HGVs. It would also alter pedestrian crossing facilities across Sir Harry Lauder Road and Portobello High Street to accommodate this, but without making any substantial improvements.

4.6 Other than reducing the risk of conflicts between cyclists proceeding straight ahead towards Inchview Terrace and vehicles turning left onto Sir Harry Lauder Road, due to the permanent removal of the filter lane, this option would provide minimal improvement for people walking, wheeling and cycling.

Option 2 – Segregated Cycle Route with Two Phase Crossing

4.7 This option would remove the following left turn filter lanes at the junction:

4.7.1 From Portobello High Street into Sir Harry Lauder Road;

4.7.2 From Sir Harry Lauder Road into Inchview Terrace; and

4.7.3 From King’s Road into Portobello High Street.

4.8 The left turn filter lane from Inchview Terrace into Seafield Road East would remain.

4.9 A segregated cycle route between Portobello High Street and Inchview Terrace, incorporating a two stage controlled crossing across Sir Harry Lauder Road, would be introduced. The number of pedestrian crossing stages required to cross Portobello High Street, Sir Harry Lauder Road, Inchview Terrace and King's Road would all be reduced by one, when compared to Option 1.

Option 3 – Segregated Cycle Route with Single Phase Crossing (3+1 Traffic Lanes)

4.10 This option would also provide a segregated cycle route between Portobello High Street and Inchview Terrace, however the controlled crossing across Sir Harry Lauder Road would operate as a single stage. The number of pedestrian crossing stages required to cross Portobello High Street, Sir Harry Lauder Road, Inchview Terrace and King's Road would all be reduced by one, when compared to Option 2.

4.11 To allow a single stage crossing across Sir Harry Lauder Road to be introduced, it would be necessary to reduce the current number of traffic lanes from five to four. Under this option, this would be achieved by retaining three northbound traffic lanes, including a dedicated right turn lane, and reducing the southbound exit from the junction to a single lane.

4.12 When compared to two stage crossings, single stage crossings may appear to improve crossing provision for those using it, however this may not always be the case. Single stage crossings require an all stop phase for traffic to be incorporated into the traffic signal phasing cycle. This phasing cycle will generally take two minutes to complete at a major junction. Therefore, if a pedestrian requires to use the three single stage crossings at the junction, they may have to wait for up to six minutes; whereas two stage crossings can offer additional opportunities to cross during the signal phasing cycle.

4.13 Single stage crossings are, however, safer as they do not require people to wait in a vulnerable position on a central island in the middle of the road. They are also the preferred option set out within the Edinburgh Street Design Guidance (ESDG) which states that designs should *'Provide direct crossings and avoid staged crossing arrangements if possible…ensure that the pedestrian/cycle environment is uninterrupted and easy to use'.*

Option 4 – Segregated Cycle Route with Single Phase Crossing (2+2 Traffic Lanes)

4.14 This option is the Concept Design previously reported to Committee. It is similar to Option 3 but achieves the necessary reduction in traffic lanes on Sir Harry Lauder Road by removing the northbound dedicated right turn lane, while retaining two southbound lanes.

4.15 Removal of the right turn lane places this junction arm in conflict with Seafield Road East. As the speed limit of Seafield Road East and Sir Harry Lauder Road is currently 40mph, separate traffic signal staging would be required for these arms. However, design work is currently underway to reduce the speed limits on both roads to 30mph. At lower speeds the two phases can run together, allowing right turns to be made in gaps in oncoming traffic. However, due to the high volume of right turning traffic, is likely that the northbound outside traffic lane will regularly become blocked by queues of traffic waiting to turn right.

4.16 Plans showing the proposed road layouts for the above four options are provided in Appendix 2. A comparison of the pedestrian and cycle facilities that would be provided under each option is provided in Table 1 below:

Option	Segregated Cycle Route – Portobello High Street to Inchview Terrace	Controlled Crossing – Sir Harry Lauder Road	Controlled Crossing - Portobello High Street	Controlled Crossing – Inchview Terrace	Controlled Crossing – King's Road	Controlled Crossing – Seafield Road East
Original Layout	No	Pedestrian only, four stages	Pedestrian only, four stages	Pedestrian only, four stages	Pedestrian only, three stages	Pedestrian only, three stages
Existing Layout (short term)	No	Pedestrian only, three stages	Pedestrian only, three stages	Pedestrian only, four stages	Pedestrian only, three stages	Pedestrian only, three stages
1	No	Pedestrian only, three stages	Pedestrian only, three stages	Pedestrian only, four stages	Pedestrian only, three stages	Pedestrian only, three stages
2	Yes	Pedestrian and cyclist, two stages	Pedestrian only, two stages	Pedestrian only, three stages	Pedestrian only, two stages	Pedestrian only, three stages
3	Yes	Pedestrian and cyclist, single stage	Pedestrian only, single stage	Pedestrian only, two stages	Pedestrian only, single stage	Pedestrian only, three stages
4	Yes	Pedestrian and cyclist, single stage	Pedestrian only, single stage	Pedestrian only, two stages	Pedestrian only, single stage	Pedestrian only, three stages

Table 1 Comparison of Pedestrian and Cycle Facilities

Traffic Modelling

4.17 Traffic modelling has been undertaken to evaluate the potential impacts of each option on other transport modes.

4.18 In addition to the traffic modelling, movements by pedestrians and cyclists crossing each road at the junction were counted (the figures may therefore include pedestrians and cyclists crossing more than one road). In the morning

weekday peak traffic period (08:00-09:00), 157 pedestrians and cyclists were counted crossing, and 237 were counted in the evening period (17:00-18:00). Movements of cyclists cycling through the junction were also counted. In the morning period, 42 cyclists were counted cycling on the road through the junction, and 74 were counted in the evening.

4.19 To allow for uncertainty caused by the pandemic, traffic modelling was undertaken using both pre- and post-pandemic traffic data (2019 and 2022 respectively). The higher traffic volumes recorded in the former provide a worst case traffic impact scenario, while the 2022 volumes represent the 'new normal'. For simplicity, only traffic modelling results using 2022 traffic volumes are presented within the report. However, corresponding results using 2019 traffic volumes are presented in Appendix 3. It should be noted that both sets of results predict impacts during the morning and evening weekday peak traffic periods and that impacts at other times will be reduced.

4.20 Analysis of the options focused on three key modelling outputs: motor vehicle traffic throughput, maximum queue lengths and journey times in the morning and evening peak periods.

4.21 The predicted impacts on overall traffic throughput for each of the four medium term options, in the am and pm peak traffic periods, is shown in Table 2 below.

Peak Period	**Base (vehs/hr)**	**1: Do-Minimum**	**2: Segregated Cycle Route with Two Phase Crossing**	**3: Segregated Cycle Route with Single Phase Crossing (3+1 Traffic Lanes)**	**4: Segregated Cycle Route with Single Phase Crossing (2+2 Traffic Lanes)**
AM (08.00-09.00)	2,882	2,879 (0%)	2,905 (1%)	2,612 (-9%)	2,244 (-22%)
PM **(17.00-18.00)**	3,261	3,260 (0%)	3,230 (-1%)	2,762 (-15%)	2,426 (-26%)

Table 2 Predicted Overall Traffic Throughput (2022 Figures)

4.22 In general, as the degree of physical change at the junction and the level of improvement to infrastructure for people walking, wheeling and cycling increases, the predicted overall traffic throughput decreases.

4.23 The exception to this is Option 4, which mostly has a significantly greater predicted impact on motor vehicle traffic than Option 3, with only a marginal improvement in facilities for people walking, wheeling and cycling.

4.24 The predicted average vehicle journey time changes on each approach are shown in Table 3 below, with public transport corridors displayed in bold.

Approach	Peak Period	Base Journey Time (m:s)	1: Do-Minimum	2: Segregated Cycle Route with Two Phase Crossing	3: Segregated Cycle Route with Single Phase Crossing (3+1 Traffic Lanes)	4: Segregated Cycle Route with Single Phase Crossing (2+2 Traffic Lanes)
Sir Harry Lauder Road	AM	0:56	No change	+1:01	+3:07	+3:06
	PM	0:56	No change	+0:23	+2:23	+5:55
Sir Harry Lauder Road – right turn	AM	1:22	No change	+0:34	+2:23	Approach Lane removed
	PM	1:55	No change	+0:24	+3:23	Approach Lane removed
Inchview Terrace	**AM**	**1:22**	**-0:26**	**+0:35**	**+2:41**	**+2:40**
	PM	**1:23**	**No change**	**+0:46**	**+2:36**	**+2:40**
Seafield Road East	AM	0:57	No change	-0:02	+0:12	+11:28
	PM	1:02	No change	+0:04	+5:05	+5:32
Seafield Road East – right turn	AM	1:30	No change	+0:02	+0:50	+7:20
	PM	1:27	No change	No change	+4:53	+3:30
King's Road	AM	1:47	No change	+0:01	+0:01	+0:01
	PM	2:43	No change	-0:08	-0:04	-0:04
Portobello High Street	**AM**	**1:05**	**+0:01**	**+0:19**	**+3:53**	**+3:42**
	PM	**1:09**	**+0:01**	**+0:23**	**+2:07**	**+6:44**

Table 3 Predicted Journey Times Changes (2022 Figures)

4.25 Both Inchview Terrace and Portobello High Street serve as public transport corridors and journey time increases on these roads would negatively impact on several scheduled bus services.

4.26 Options 1 and 2 are predicted to have minimal impact on vehicle journey times while Options 3 and 4 will have a greater impact. For example, under Option 3 buses on Portobello High Street are predicted to experience journey time increases (i.e. on top of current journey times) of three minutes and 53 seconds in the morning peak period. Option 4 could result in bus journey time increases of up to six minutes and 44 seconds in the evening peak period.

4.27 Traffic modelling has been used to predict impacts based on maximising the overall motor traffic efficiency of each option. There may be scope during detailed design to provide for increased priority for public transport routes passing through the junction. This could include measures such as additional signals green time for the bus corridors, or utilising bus detection measures which could prioritise green time when buses are detected on approaches. However, this would be at the expense of reducing overall motor traffic efficiency and it could also lead to general traffic using different routes through

the junction so they can benefit from reduced queuing on the public transport corridors.

4.28 The Council has been awarded Sustrans Places for Everyone funding to develop concept designs for town centre improvements for Portobello in line with the Council's 20-Minute Neighbourhood Strategy. The project will aim for the town centre to be a more liveable place (with less car dependence, better active travel provision and higher quality public spaces) which may have the result of reducing the amount of traffic using the High Street. The traffic modelling work does not take account of this, as work is currently at an early stage and the potential impacts are not yet possible to predict. However, any traffic reduction as a result of the 20-minute neighbourhood changes could partly mitigate the predicted impacts on motor traffic, including buses.

4.29 A key Council objective is to cut car kilometres travelled by 30% by 2030. The impact of this has not been considered within the traffic modelling work undertaken for each option. While this reduction may not be achieved uniformly across the whole of the city's network, any reduction in current traffic levels at the junction would mitigate the predicted increases to journey times for motor traffic.

4.30 A summary of the impact of each option on motor traffic and people walking, wheeling and cycling is provided in Table 4 below:

1: Do-Minimum	• The identified accident risk (conflict between cyclists heading straight ahead and traffic turning left from Portobello High Street to Sir Harry Lauder Road) has been mitigated against, with minimal intervention. • Minimal improvement for people walking, wheeling and cycling. • Almost no impact on motor traffic.
2: Segregated Cycle Route with Two Phase Crossing	• Segregated cycle route through the junction (from Portobello High Street to Inchview Terrace). • Two stage pedestrian and cycle crossing across Sir harry Lauder Road. • Multi-stage pedestrian crossings retained on all other arms. • Marginal impact on motor traffic if using 2022 traffic levels.
3: Segregated Cycle Route with Single Phase Crossing (3+1 Traffic Lanes)	• Segregated cycle route through the junction (from Portobello High Street to Inchview Terrace). • Single stage pedestrian and cycle crossing across Sir Harry Lauder Road. • Single stage pedestrian crossings on all other arms except Seafield Road East. • Predicted reduction in traffic throughput of between 9% and 15% during peak traffic periods, using 2022 traffic levels, with consequent increases in queue lengths and journey times. • Potential for some strategic or local traffic re-routeing, resulting in adverse impacts on alternative routes.
4: Segregated Cycle Route with Single Phase Crossing (2+2 Traffic Lanes)	• Segregated cycle route through the junction (from Portobello High Street to Inchview Terrace). • Single stage pedestrian and cycle crossing across Sir Harry Lauder Road. • Single stage pedestrian crossings on all other arms except Seafield Road East. • Predicted reduction in traffic throughput of between 22% and 26% during peak traffic periods, using 2022 traffic levels, with consequent increases in queue lengths and journey times.

	• Potential for significant strategic or local traffic re-routeing, resulting in adverse impacts on alternative routes.

Table 4 Summary of Impacts on Users

4.31 A report containing further details of the traffic modelling and its outputs is provided in Appendix 4.

Proposed Way Forward

4.32 Traffic modelling output and feedback from the key stakeholder group which was set up for the project has been carefully considered, with the aim of identifying a solution that achieves the best balance between reducing the risk of further serious or fatal collisions involving people walking, wheeling or cycling and reducing the impact on other transport modes (particularly public transport). Following this, it is recommended that Option 3 is taken forward for design and delivery.

5. Next Steps

5.1 If Committee approve the recommendations, detailed design work will be undertaken for the preferred option and a contractor will then be procured to undertake construction. It is expected that delivery of the improvements would take place in summer 2024.

5.2 Longer term improvements will be considered as part of the citywide review of safety at major junctions that was instructed by Committee on 12 November 2020. An update on this was reported to Committee on 20 April 2023.

6. Financial impact

6.1 The medium-term improvements will be funded from the block allocation for Road Safety within the Council's Transport Capital Investment Programme. A detailed cost estimate will be prepared for the preferred option as part of the design process. Initial estimates, for budgetary purposes only, are approximately £150,000 - £200,000 for Option One and approximately £750,000 - £1,000,000 for Options Two, Three or Four.

7. Stakeholder/Community Impact

7.1 A key stakeholder group, involving the Convener of Transport and Environment, local Ward members, representatives of local Community Councils, Spokes, Spokes Porty and Lothian Buses, has met with officers on two occasions since the implementation of the short term improvements in summer 2022.

7.2 Delivery of the medium-term proposals will require the promotion of Traffic Orders. The statutory process for this includes advertising the proposals to allow those potentially affected to comment or object formally.

7.3 The improvements will help achieve the targets of the Draft Road Safety Action Plan for Edinburgh to 2030, which includes a target of zero road fatalities by 2030 and at least a 50% reduction on people seriously injured on the roads

8. Background reading/external references

8.1 Updates to Transport and Environment Committee on:

8.1.1 12 November 2020;

8.1.2 14 October 2021;

8.1.3 8 December 2022; and

8.1.4 2 February 2023.

8.2 Draft Road Safety Action Plan for Edinburgh to 2030

9. Appendices

9.1 Appendix 1 – Plan showing Current Road Layout

9.2 Appendix 2 – Plans of Four Options

9.3 Appendix 3 – Traffic Throughput and Journey Times using 2019 Figures

9.4 Appendix 4 – Traffic Modelling Report

TRANSPORT CONTRACTS AND DESIGN

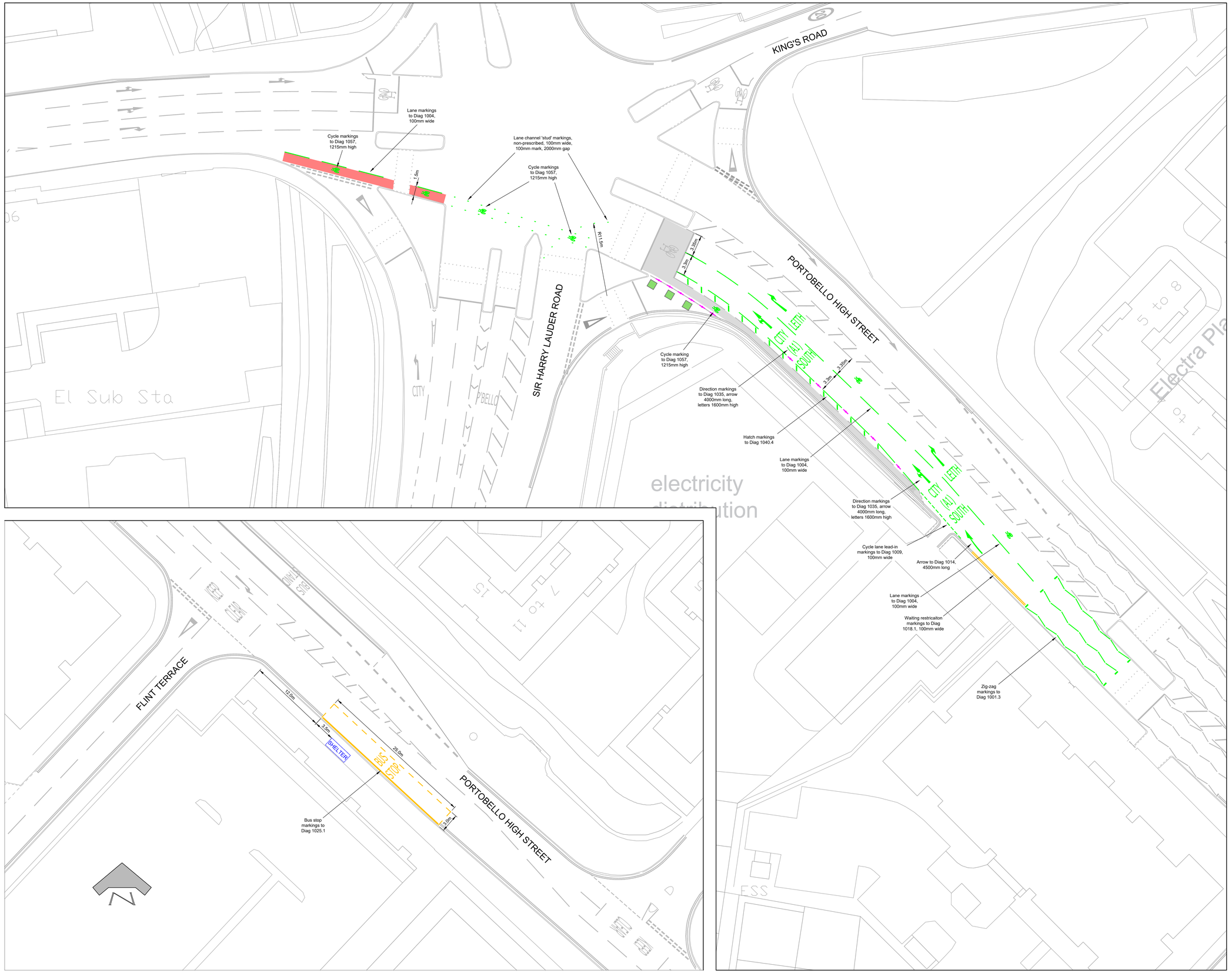
DRG. NO. TCD/000029/8/1201A

NOTES:

1. All drawings are to be read in conjunction with relevant Specification and all other drawings.
2. All dimensions and levels to be checked on site and any discrepancies identified prior to the commencement of the works.
3. All dimensions in millimetres unless otherwise noted.
4. All levels in metres unless otherwise noted.
5. The Specification is *The Specification for Highway Works*.
6. Traffic signs and road markings as per the Traffic Signs Regulations and General Directions 2016.
7. Refer to Appendices 12/1 and 12/3.

KEY:

- White road markings
- Yellow road markings
- Red-coloured surfacing (shown for context)
- Planter (supplied by the City of Edinburgh Council)
- Temporary kerb & wand (supplied by the City of Edinburgh Council)
- SHELTER — Bus shelter (shown for context)



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The City of Edinburgh Council
Waverley Court
4 East Market Street
Edinburgh, EH8 8BG
Telephone: 0131 200 2000

PLACE MANAGEMENT
ROADS AND TRANSPORT INFRASTRUCTURE
TRANSPORT CONTRACTS AND DESIGN

Portobello High Street / Sir Harry Lauder Road Junction Banned Turn for Vehicles >7.5 Tonnes Traffic Signs and Road Markings

Date: March 2022	Job. No. 000029	Drawn by: A Parkinson
Scale: 1:200 @A0		Checked by: T Booth

DRG. NO. TCD/000029/8/1201A

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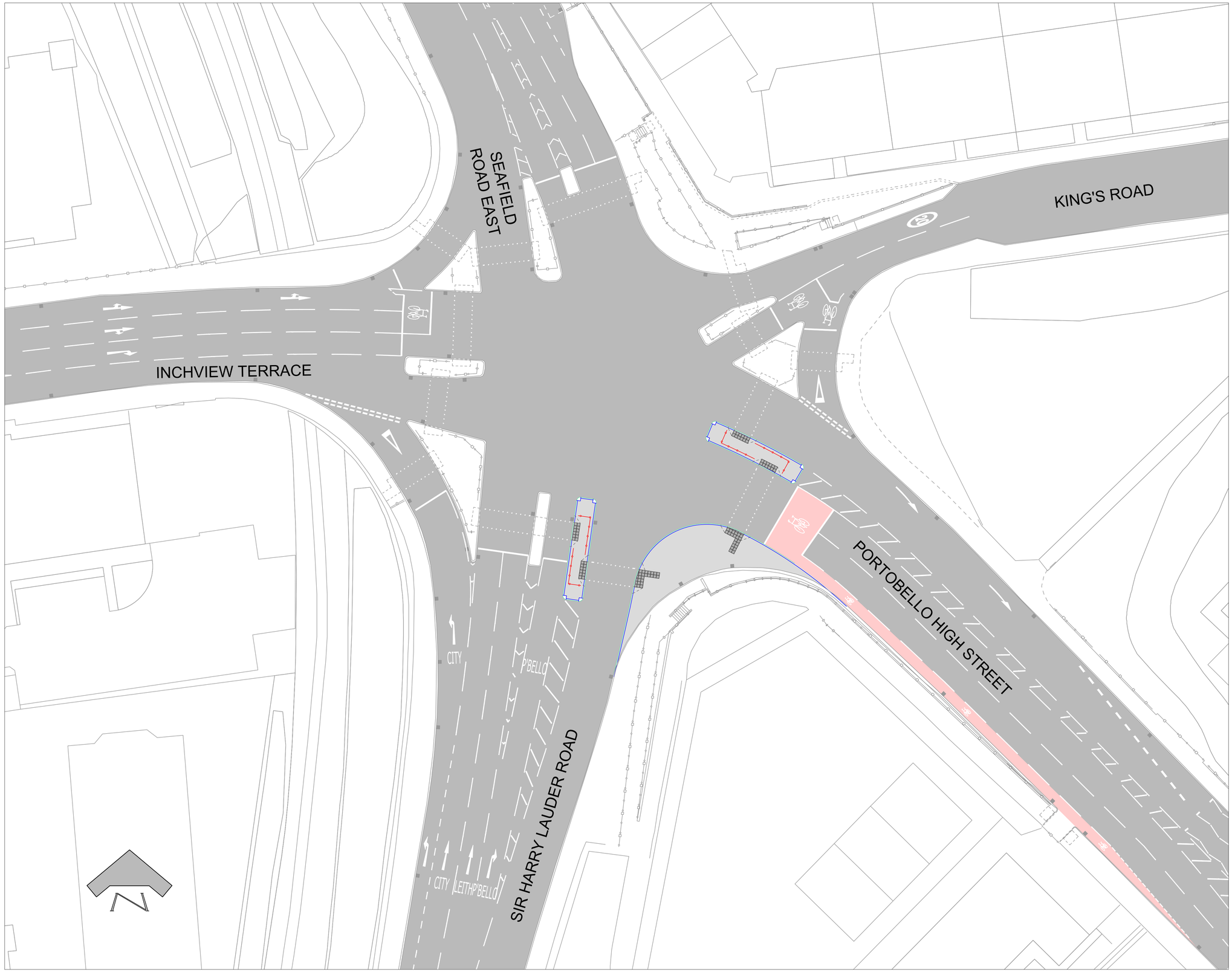
TRANSPORT CONTRACTS AND DESIGN

DRG. NO. TCD/000029/2/21

NOTES:



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The City of Edinburgh Council
Waverley Court
4 East Market Street
Edinburgh, EH8 8BG
Telephone: 0131 200 2000

OPERATIONAL SERVICES
ROADS AND INFRASTRUCTURE
TRANSPORT CONTRACTS AND DESIGN

Sir Harry Lauder Road/
Portobello High Street Junction
Phase 2
Option 1

Date: May 2023
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Job No.: 000029
Drawn by: A Parkinson
Checked by: SH

DRG. NO. TCD/000029/2/21

DRG. NO. TCD/000029/2/21

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Xrefs: ..\s-refs\Phase 2\ODM Phase 2 Opt 3B

Appendix 3: Traffic Throughput and Journey Times using 2019 Traffic Figures

The predicted impacts on overall traffic throughput for each of the four medium term options using the 2019 traffic data, is shown in Table A1 below.

Peak Period	Base (vehs/hr)	1: Do-Minimum	2: Segregated Cycle Route with Two Phase Crossing	3: Segregated Cycle Route with Single Phase Crossing (3+1 Traffic Lanes)	4: Segregated Cycle Route with Single Phase Crossing (2+2 Traffic Lanes)
AM (08.00-09.00)	3400	3379 (-1%)	3145 (-8%)	2755 (-19%)	2276 (-33%)
PM (17.00-18.00)	3575	3560 (0%)	3496 (-2%)	2879 (-19%)	2462 (-31%)

Table A1 Predicted Overall Traffic Throughput (2019 Figures)

The predicted average vehicle journey time changes on each approach using the 2019 traffic data, are shown in Table A2 below, with bus corridors displayed in bold.

Approach	Peak Period	Base Journey Time (m:s)	1: Do-Minimum	2: Segregated Cycle Route with Two Phase Crossing	3: Segregated Cycle Route with Single Phase Crossing (3+1 Traffic Lanes)	4: Segregated Cycle Route with Single Phase Crossing (2+2 Traffic Lanes)
Sir Harry Lauder Road	AM	0:59	-0:01	+2:17	+2:53	+3:00
	PM	1:00	-0:02	+1:22	+3:38	+3:34
Sir Harry Lauder Road – right turn	AM	1:26	-0:05	+2:04	+2:12	Approach lane removed
	PM	2:39	+0:18	+0:49	+4:18	Approach lane removed
Inchview Terrace	**AM**	**1:24**	**+0:12**	**+4:02**	**+4:58**	**+6:03**
	PM	**1:34**	**-0:09**	**+0:54**	**+2:38**	**+2:32**
Seafield Road East	AM	0:59	-0:02	-0:06	+0:49	+10:50
	PM	1:09	+0:02	+0:11	+4:12	+5:24
Seafield Road East – right turn	AM	1:28	-0:10	-0:08	+0:45	+6:47
	PM	1:09	+0:15	+0:15	+4:08	+4:12
King's Road	AM	2:00	-0:21	-0:10	+0:06	-0:06
	PM	1:43	+0:35	+0:30	+1:05	+0:47
Portobello High Street	**AM**	**1:51**	**-0:26**	**+1:35**	**+3:23**	**+3:06**
	PM	**1:14**	**-0:01**	**+0:28**	**+3:34**	**+6:37**

Table A2 Predicted Journey Times Changes (2019 Figures)

King's Road Junction Modelling

Medium Term Options

Draft

02 June 2023

The City of Edinburgh Council

King's Road Junction Modelling

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Document Title:	King's Road Junction Modelling
Document No.:	1
Revision:	1
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Client No:	7357
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Author:	Lewis Murray-Zmijewski
File Name:	Final Report King's Road Junction Modelling of Medium Term Options

Jacobs U.K. Limited

160 Dundee Street
Edinburgh
EH11 1DQ
United Kingdom
T +44 (0)131 659 1500
F +44 (0)131 228 6177
www.jacobs.com

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Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
1	12.05.23	Draft Report	LMZ	GD	LMZ	GD
2	02.06.23	Final Report	LMZ	GD	LMZ	GD

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1. Introduction

1.1 Introduction

Recent cycling fatalities at the King's Road junction with Portobello High Street, Sir Harry Lauder Road, Inchview Terrace and Seafield Road East has prompted a safety review of the junction in order to better cater for vulnerable users. The review consists of short, medium and long term measures to improve safety for cyclists and pedestrians.

Jacobs were previously commissioned by City of Edinburgh Council (the Council) in 2021 to undertake a VISSIM traffic modelling assessment of short term options. This is summarised in the "*Draft King's Road Junction Modelling of Safety Improvements_updated*" report and recommended closing the left turn filter lane from Portobello High Street to Sir Harry Lauder Road, which has since been implemented on street.

The short term safety improvement measures were a temporary fix and there is a need to implement more permanent physical changes to the junction in the medium term that can easily transition into a long term solution. This report, and associated traffic modelling, assesses proposed medium term options that have been developed by the Council.

A new VISSIM microsimulation model of the King's Road junction was developed as part of the appraisal of the short term safety improvement options. This traffic model will again be used to assess the medium term options and will focus on the impact on general traffic operation as a result of the safety improvements. Jacobs will not provide any recommendations as to the safety benefits/disbenefits of the options.

The cycling fatalities occurred on the Portobello High Street approach to the junction, and both were a result of the conflict between the straight ahead cycle movement and left turning vehicles. As shown in Figure 1.1.

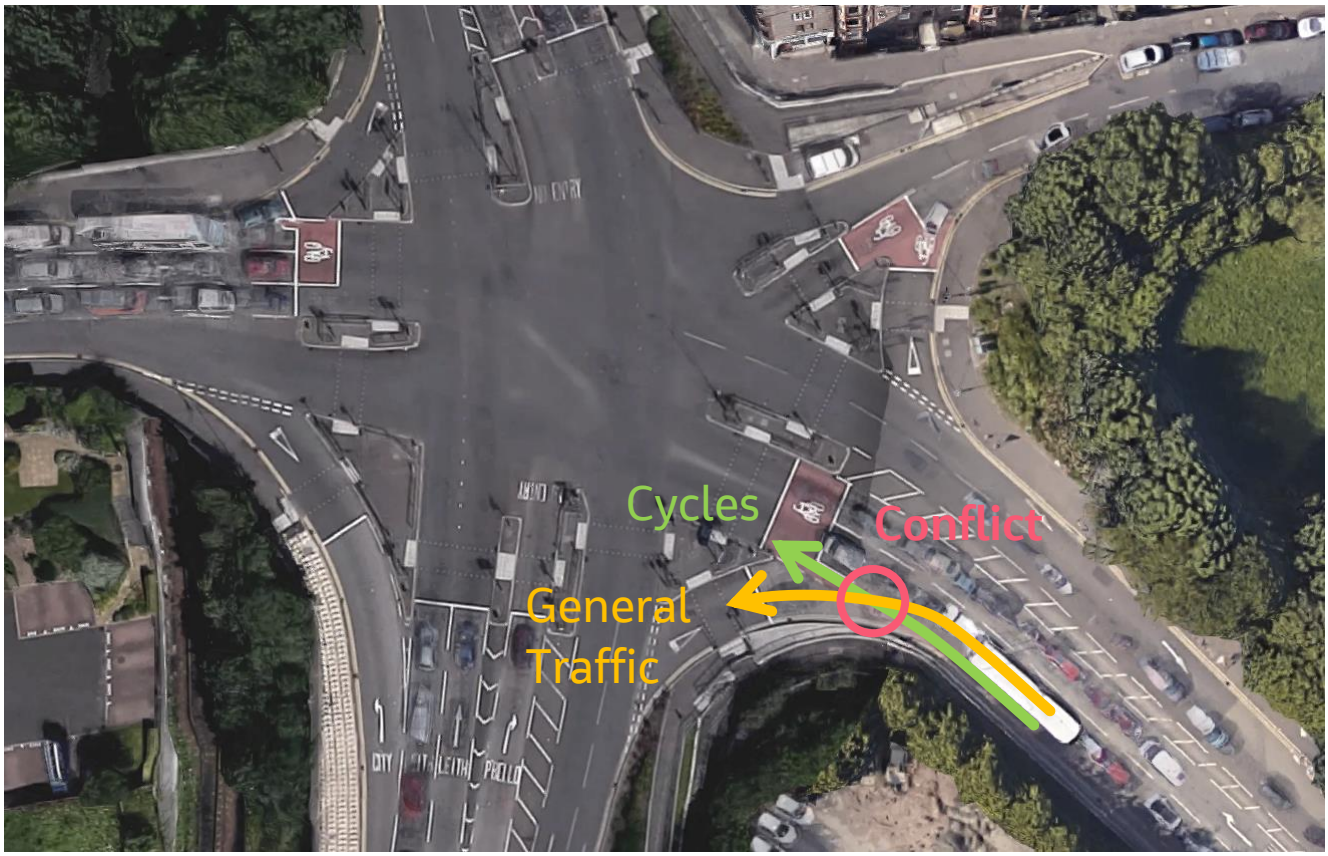

Figure 1.1: Cycling/Vehicle Conflict

1.2 Strategic Function

The King's Road junction is one of the busiest junctions in the city of Edinburgh with around 3,500 vehicles per hour passing through the junction during peak times. The junction is located on the A199 Seafield Road East which is the key route from the A1 to the north of the city. Sir Harry Lauder Road was constructed as the Portobello Bypass and it is important that it continues to operate effectively as such to keep traffic volumes on Portobello High Street to a minimum.

Recent work undertaken by the Council, in developing Edinburgh's Circulation Plan, has identified Primary, Secondary and Local road networks. As shown in Figure 1.2, the study categorised three of the roads feeding into King's Road junction (Sir Harry Lauder Road, Seafield Road East and Inchview Terrace) as being Primary. This recognises that in the short and medium term, traffic volumes on these corridors are likely remain high. While significant traffic reduction (a target of 30%) is possible through the city centre and in local neighbourhoods, displaced traffic has the potential to result in much lower levels of traffic reduction on Primary corridors such as the A199.

Figure 1.2: Edinburgh's Circulation Plan General Traffic Network

2. VISSIM Model Development

2.1 Model Description

A bespoke microsimulation (VISSIM) Base model of the King's Road junction has been developed to assess the impact of the safety improvement options on general traffic.

The model includes the five approach arms to the junction: King's Road, Portobello High Street, Sir Harry Lauder Road, Inchview Terrace and Seafield Road East. The basic VISSIM model is shown in Figure 2.1 with a 3D animation of the traffic model over a Microsoft Bing© background mapping in Figure 2.2 below.

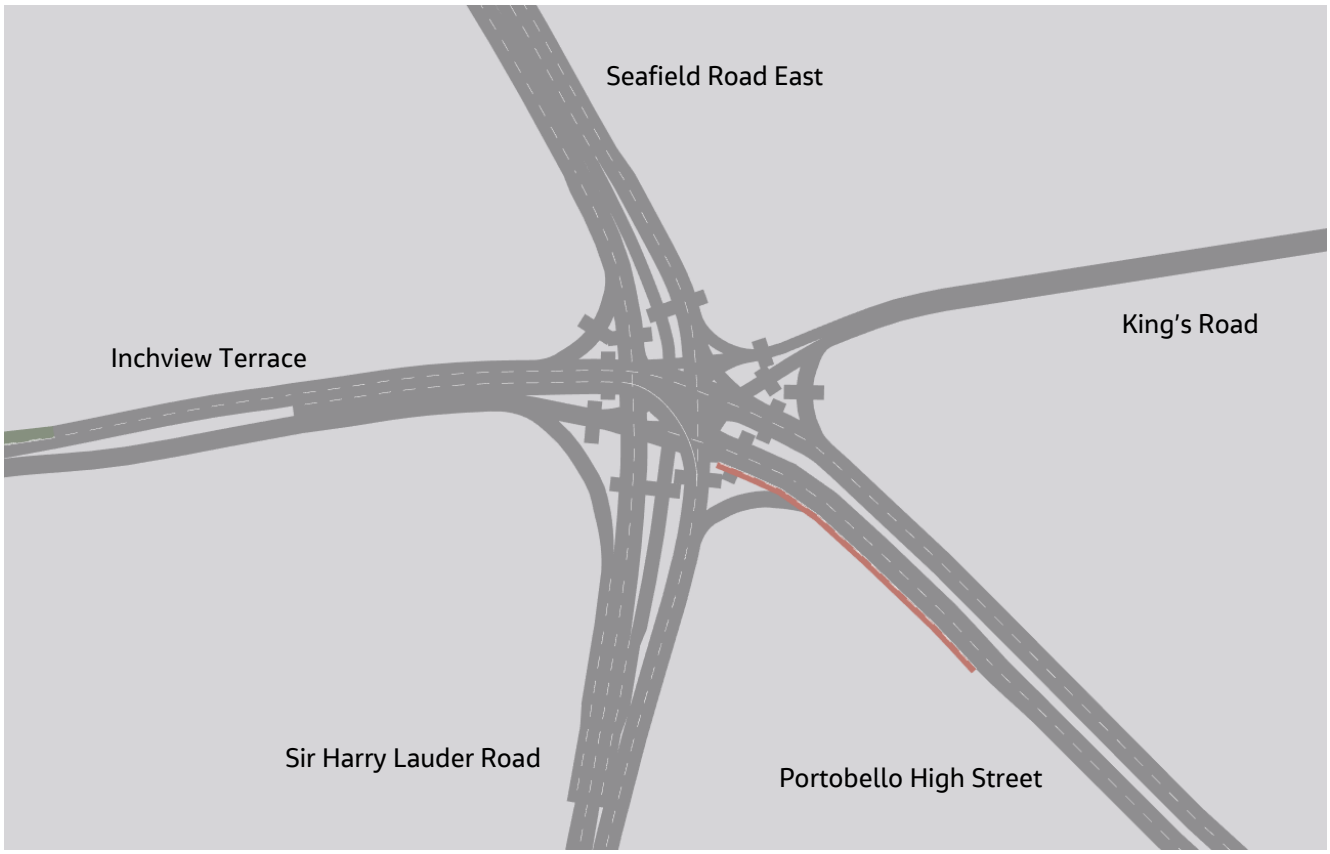

Figure 2.1: Base Model Network

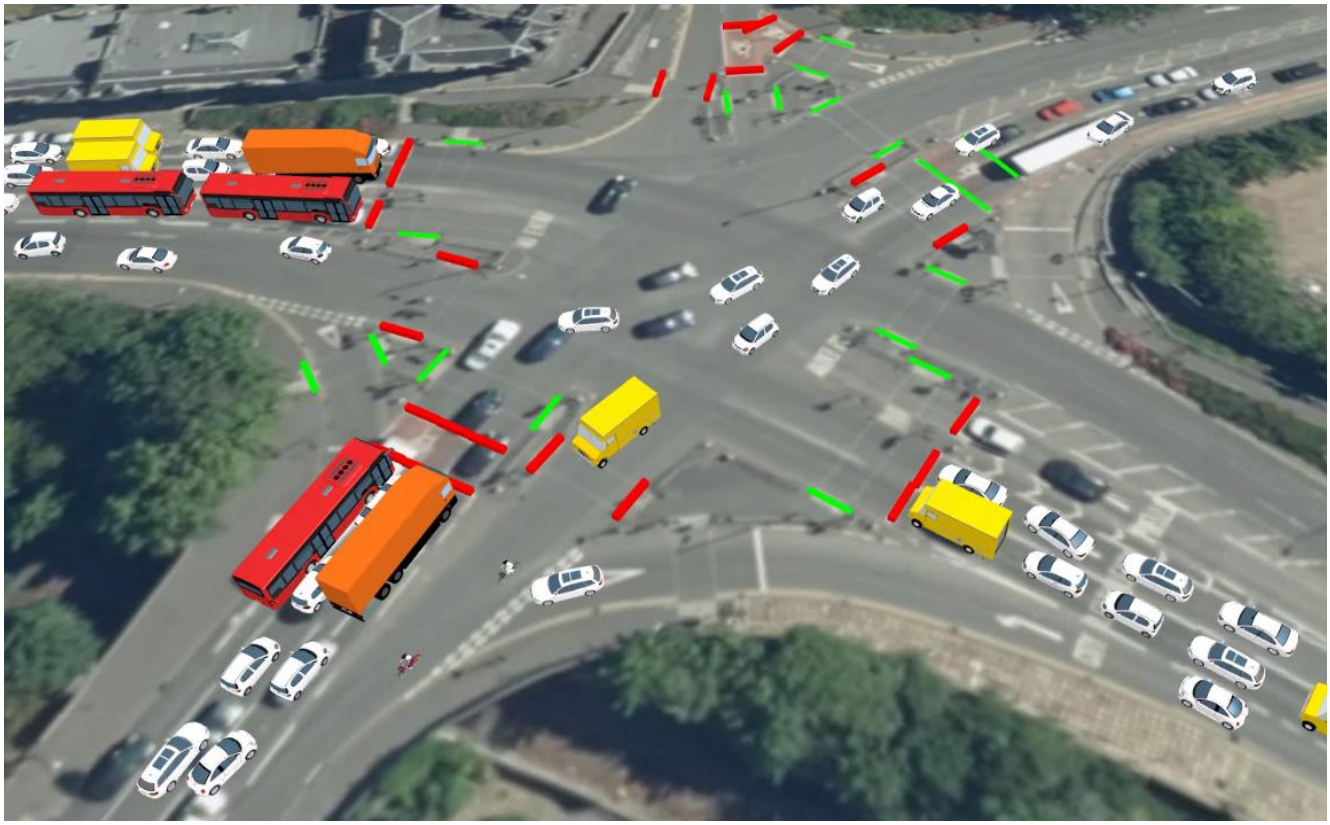

Figure 2.2: 3D Representation of Base Model

Options are anticipated to impact on general traffic capacity and may result in significant queues developing. Therefore, modelling was undertaken at the two busiest times of the day:

- AM peak hour (0800-0900) with a one hour warm up period, and;
- PM peak (1700-1800) with a one hour warm up period.

The model was calibrated using observed junction turning count data from 2019. The COVID-19 pandemic has significantly impacted travel patterns and reduced traffic volumes in Edinburgh. Using traffic count information pre COVID-19, when traffic volumes were greater than current levels, allows for the worse case traffic impacts to be assessed.

The observed traffic data allowed for six vehicle types to be modelled: car, taxi, LGV, HGV, bus/coach and cycles. The vehicle demands were modelled in 15 minute intervals for each vehicle type in the morning peak (07:00-09:00) and the evening peak (16:00-18:00). This provided an accurate demand profile to ensure the correct demands throughout the peak periods were represented and the resulting queuing captured in sufficient detail.

Traffic signal timings at the King's Road junction were provided by the Council for all approach arms and pedestrian crossings. The model replicates the method of control specified in the controller configuration supplied by the Council. A Vehicle Actuated Program (VAP) logic was developed to ensure the staging, minimum/maximum green and intergreen timings in the model simulated the configuration of the on-site traffic signal controller. The on-site and modelled controllers allocate green time within the traffic signal cycle according to demand levels on the approaching arms.

2.2 Base Model Calibration

The VISSIM Base model of the King's Road junction was calibrated using the 2019 junction turning count data. Modelled traffic flows were compared to the count data using GEH, which is a statistic that demonstrates the goodness of fit between the two pieces of data. A GEH value of <5 indicates a good match, GEH 5 to 10 an adequate match and >10 a poor match.

Table 2.1 outlines the excellent fit between observed and modelled traffic flows. All turning movements through the junction for all vehicle types have a GEH less than 5. Full calibration results are presented in Appendix A.

Table 2.1: Traffic Flow Calibration Summary

Vehicle Type	AM peak (07:00-09:00)	PM peak (16:00-18:00)
	GEH < 5	GEH < 5
Cars	100%	100%
Taxis	100%	100%
LGV	100%	100%
HGV	100%	100%
Buses & Coaches	100%	100%
Cycles	100%	100%

2.3 Base Model Validation

The Base model was validated against maximum traffic queues on the approach arms to King's Road junction. Comparison of observed queues and modelled queues provide a good indication that the network, traffic signal and count data used to develop the model are resulting in the same network impacts to those observed.

No observed queue information was readily available at the King's Road junction. However, the Council advised queue estimates from past experience of the junction's operation during the peak periods. These maximum queue length estimates are provided in Table 2.2 alongside the model maximum lengths. Note: estimates were not provided for the King's Road approach as there is no significant queuing on this arm.

Table 2.2: Maximum Queue Length Validation Summary (metres)

Approach	AM (07:00-09:00) Max Queue		PM (16:00-18:00) Max Queue	
	Observed (m)	Modelled (m)	Observed (m)	Modelled (m)
Seafield Road	140	114	140	164
King's Road	Not provided	20	Not provided	27
Portobello High Street	220	201	220	191
Sir Harry Lauder Road	190	180	190	132
Inchview Terrace	110	154	110	184

2.4 2022 Scenario

Additional observed traffic count data was collected in June 2022 at King's Road junction. The 2022 traffic volumes are lower than in 2019 at this location, and for the medium term options, the 2022 data will be used as a second appraisal scenario. 2019 traffic volumes will be used to determine the traffic impacts if demands return to those pre-pandemic, while 2022 volumes will be used to assess impacts if a 'new normal' has been reached in terms of traffic demands.

3. Medium Term Options

The four medium term options are described in the following section of this report. In general, the options gradually increase the degree of physical change at the junction and the level of cycle and pedestrian safety improvement provided.

3.1 Option 1: Do-Minimum

The first option makes the short term safety improvement solution permanent. It removes the left turn filter lane from Portobello High Street to Sir Harry Lauder Road and declutters the associated pedestrian crossing traffic signal poles at this location.

This option removes the identified risk of left turning traffic conflicting with cycles but does not improve the junction for cycles or pedestrians at any other location of the junction.

The proposed layout for Option 1 is shown in Figure 3.1.

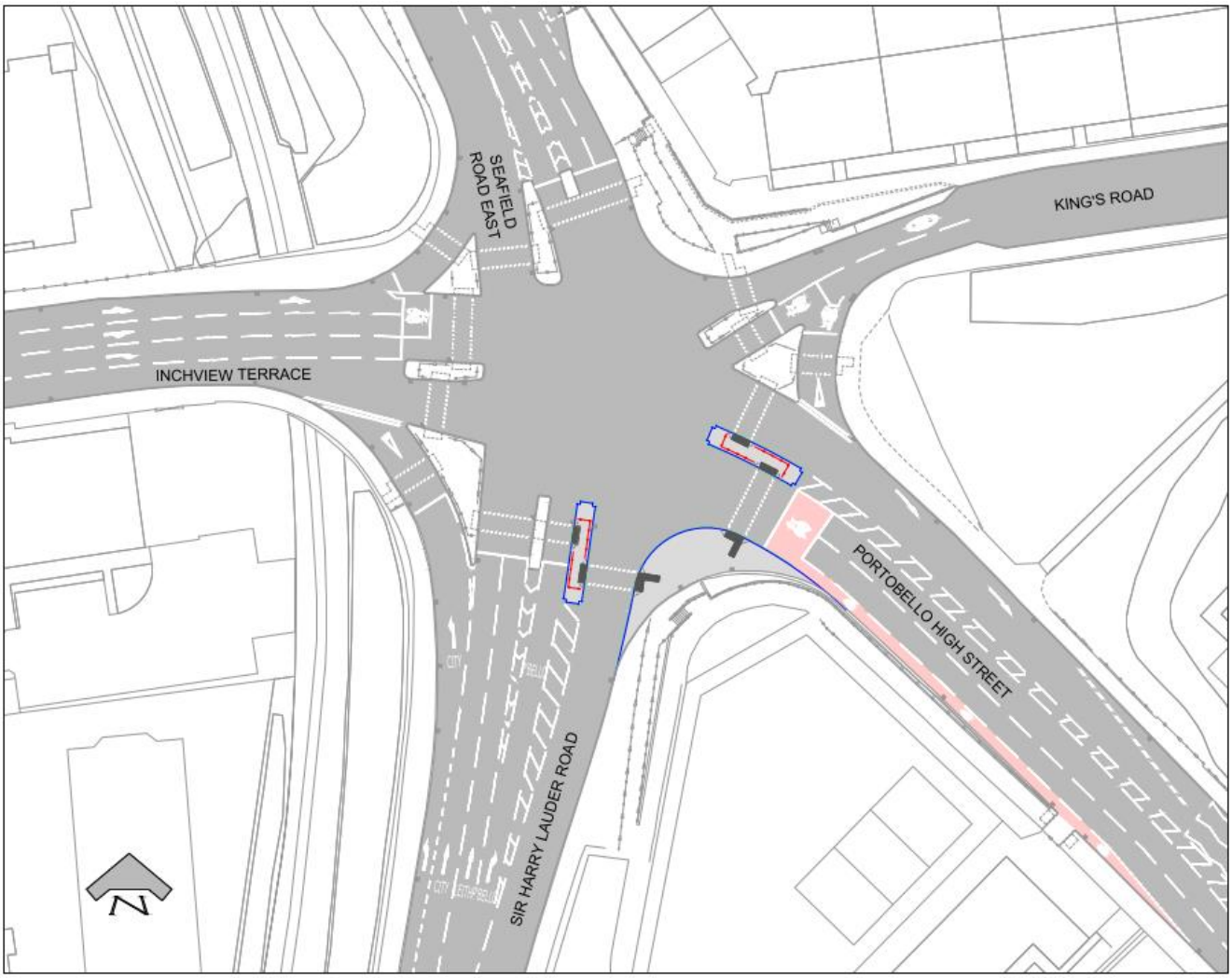

Figure 3.1: Option 1 – Do-Minimum

3.2 Option 2: Segregated Cycle Route with Two Phase Crossings

Option 2 removes the left turn filter lanes from Portobello High Street, Sir Harry Lauder Road, Inchview Terrace and King's Road, as well as the flare lane from Inchview Terrace. These changes allow for a designated cycle lane from Portobello High Street to Inchview Terrace.

Removal of the left turn filters reduces the number of crossings for pedestrians and cycles, but two phase crossings over the five junction arms are retained. The island on Sir Harry Lauder Road has been increased to 5m in width to safely stack cycles.

The proposed layout for Option 2 is shown in Figure 3.2.

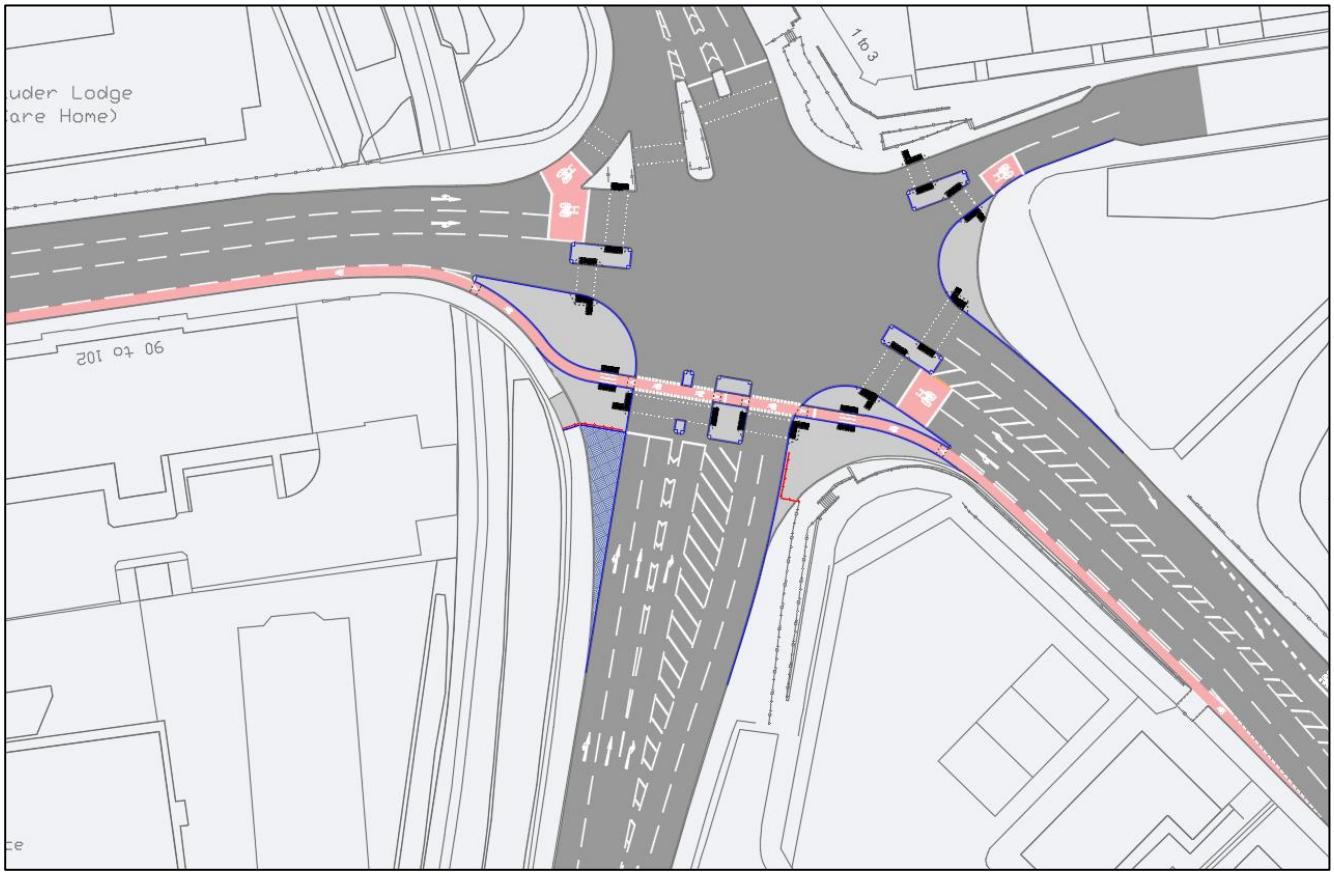

Figure 3.2: Option 2 – Segregated Cycle Route with Two Phase Crossings

3.3 Option 3: Segregated Cycle Route with Single Phase Crossings (3+1 Traffic Lanes)

Option 3 proposes the same lane removals as in Option 2 and also includes single crossings over Portobello High Street, Sir Harry Lauder Road, Inchview Terrace and King's Road. The designated cycle lane from Portobello High Street to Inchview Terrace is retained, but due to the crossing width exceeding the desired maximum of 15m, a southbound lane on Sir Harry Lauder Road is required to be removed.

In comparison to two phase crossings, single crossings may appear to improve crossing provision for cycles and pedestrians, however, this is not always the case. Single crossings require a general traffic all stop phase in the traffic signal cycle, which occurs once every two minutes. If needing to cross multiple arms [e.g. Portobello High Street (eastern side) to Seafield Road East (western side)] a pedestrian would be required to wait up to six minutes (three crossings). Whereas two phase crossings offer more opportunities throughout the two minute signal cycle to cross sections of each junction arm.

The proposed layout for Option 3 is shown in Figure 3.3.

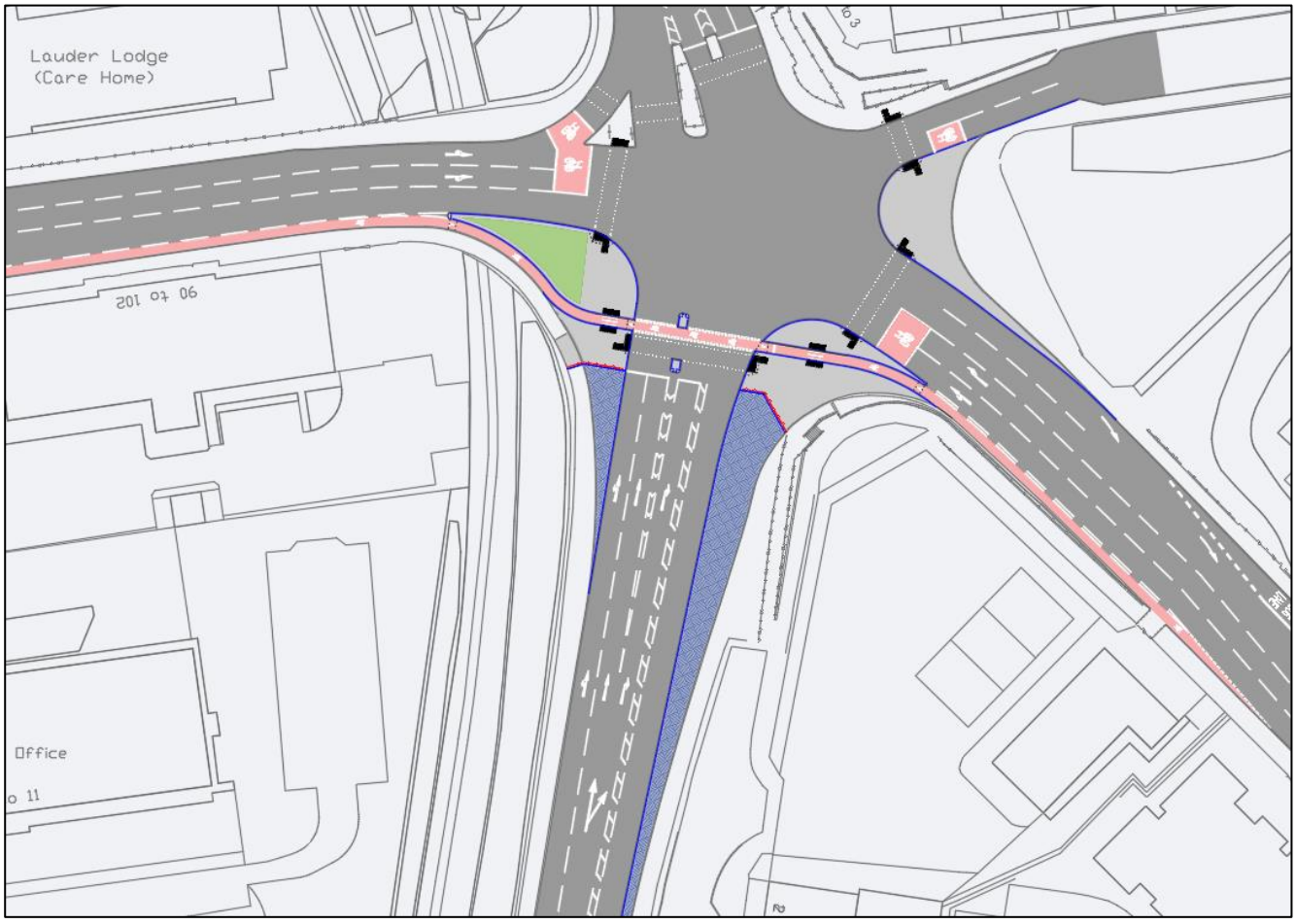

Figure 3.3: Option 3 – Segregated Cycle Route with Single Phase Crossings (3+1 Traffic Lanes)

3.4 Option 4: Segregated Cycle Route with Single Phase Crossings (2+2 Traffic Lanes)

The final option is similar to Option 3 but removes the third northbound lane from Sir Harry Lauder Road and retains two southbound lanes. This option proves more capacity southbound on Sir Harry Lauder Road but reduces northbound capacity.

In addition, removal of the right turn lane from Sir Harry Lauder Road places this junction arm in conflict with Seafield Road East and these two junction arms are required to be separated in the traffic signal staging. Currently, and in Options 1-3, these junction arms operate at the same stage during the traffic signal cycle.

The proposed layout for Option 4 is shown in Figure 3.4.

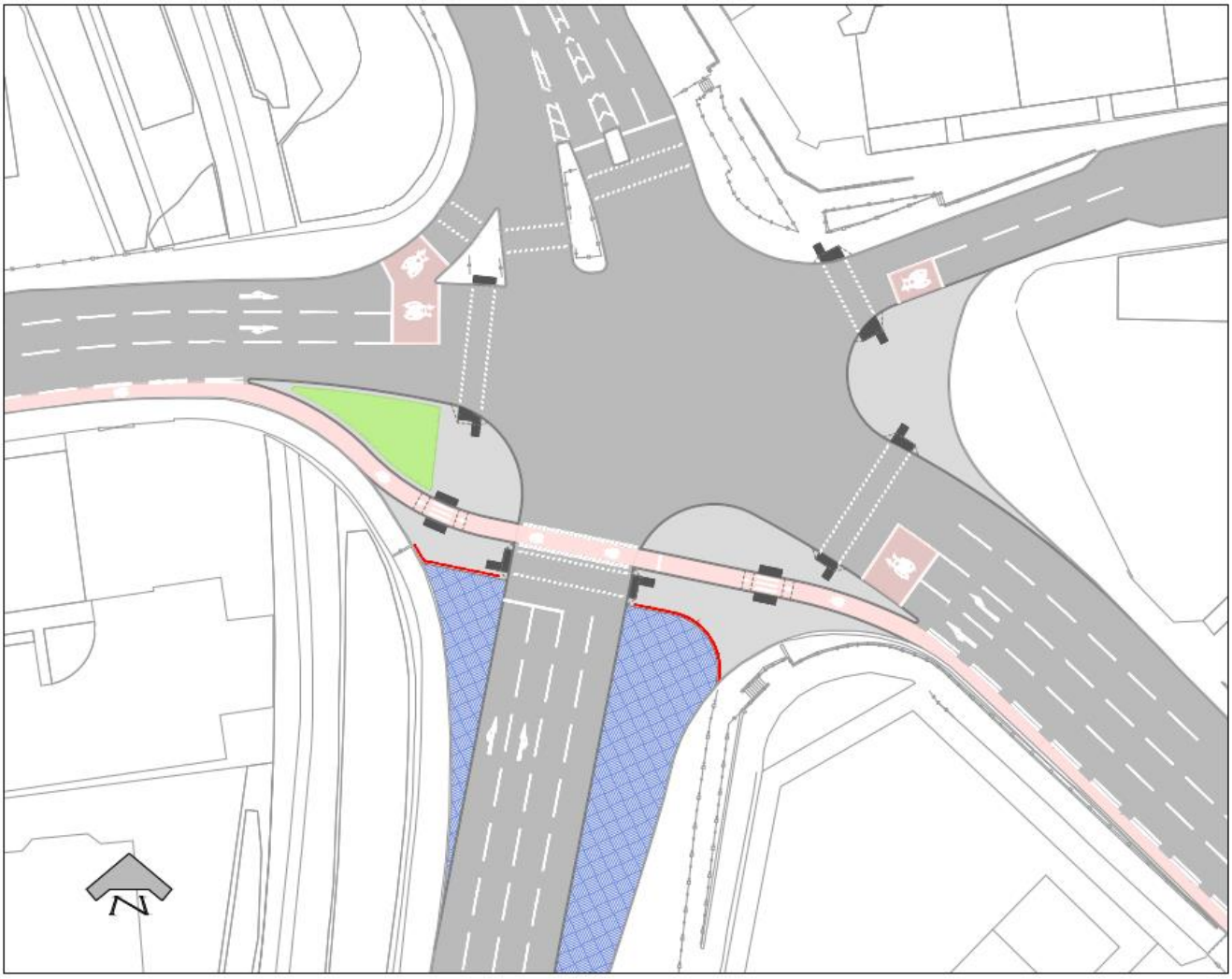

Figure 3.4: Option 4 – Segregated Cycle Route with Single Phase Crossings (2+2 Traffic Lanes)

4. Modelling Results

4.1 Introduction

The key findings from the traffic modelling of the proposed medium term options are highlighted in this section of the report. Analysis of the options focuses on three key modelling outputs:

- **Junction throughput** – the impacts on the number of vehicles able to pass through the junction from each approach arm under the different option proposals.
- **Maximum queue lengths** – the potential queue lengths on each junction arm as a result of the different option proposals.
- **Journey times** – journey times on approach to King's Road junction. Time taken to travel 200m on King's Road approach and 300m on all other approaches.

As previously mentioned in Chapter 2, modelling was undertaken for two different traffic demand scenarios: 2019 and 2022. A comparison of the traffic flows (Car, Taxi, LGV, HGV and Bus) in the AM (08:00-09:00) and PM (17:00-18:00) peak hours is shown in Table 4.1.

Table 4.1: 2019 and 2022 Observed Traffic Volumes

Approach	AM (08:00-09:00)		PM (17:00-18:00)	
	2019	2022	2019	2022
Seafield Road East	768	645	1039	864
King's Road	29	20	39	28
Portobello High Street	768	570	574	521
Sir Harry Lauder Road	1193	1068	1158	1071
Inchview Terrace	626	565	831	815
JUNCTION TOTAL	**3384**	**2868**	**3541**	**3299**

Note that the observed traffic volumes listed in the table above will differ slightly from the those shown in the Base models.

4.2 Junction Throughput

4.2.1 AM Model Analysis

Modelled throughput from the four medium term options are shown in Table 4.2 below for the 2019 AM peak hour. The percentage change from the Base model is shown in brackets for reference.

Table 4.2: AM 2019 Modelled Throughput

Approach	Base	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Seafield Road East	757	767 (+1%)	767 (+1%)	763 (+1%)	377 (-50%)
King's Road	29	27 (-7%)	27 (-7%)	27 (-7%)	29 (0%)
Portobello High Street	775	766 (-1%)	719 (-7%)	523 (-33%)	536 (-31%)
Sir Harry Lauder Road	1218	1193 (-2%)	1189 (-2%)	1057 (-13%)	1004 (-18%)
Inchview Terrace	621	626 (+1%)	443 (-29%)	385 (-38%)	330 (-47%)
JUNCTION TOTAL	**3400**	**3379 (-1%)**	**3145 (-8%)**	**2755 (-19%)**	**2276 (-33%)**

Option 1 has little impact on traffic throughput with only slight variations (positive and negative) across the junction arms due to minor adjustments to traffic signals to cater for the removal of the Portobello High Street to Sir Harry Lauder Road left turn filter lane.

Overall junction throughput reduces further under Option 2, primarily as a result of the removal of the flare lane from Inchview Terrace (-178 vehicles).

Implementing single crossings under Option 3 requires a traffic all stop signal phase for pedestrians and cycles to safely cross the junction. This reduces available green time from all junction arms, with the exception of King's Road that already operates on minimum green time due to low traffic volumes. Changes to traffic signal green time significantly reduces throughput from Sir Harry Lauder Road, Portobello High Street and Inchview Terrace. Seafield Road East is not impacted as this junction arm operates at the same time as Sir Harry Lauder Road, which has greater traffic volumes.

Removal of the right turn lane from Sir Harry Lauder to Portobello High Street/King's Road under Option 4 places these movements in conflict with those from Seafield Road East. Separating the two movements in the traffic signal staging further reduces capacity in addition to a traffic all stop phase for the single crossings to safely operate. With the exception of King's Road, all junction arms are significantly impacted in terms of throughput.

Modelling of the options was also undertaken under a second demand scenario using observed flows from 2022. Table 4.3 shows modelling throughput for the AM peak hour based on the 2022 traffic counts.

Table 4.3: AM 2022 Modelled Throughput

Approach	Base	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Seafield Road East	649	649 (0%)	649 (0%)	654 (+1%)	366 (-44%)
King's Road	22	22 (0%)	22 (0%)	22 (0%)	22 (0%)
Portobello High Street	573	570 (-1%)	576 (1%)	525 (-8%)	549 (-4%)
Sir Harry Lauder Road	1070	1070 (0%)	1118 (4%)	1018 (-5%)	987 (-8%)
Inchview Terrace	568	568 (0%)	540 (-5%)	393 (-31%)	320 (-44%)
JUNCTION TOTAL	**2882**	**2879 (0%)**	**2905 (1%)**	**2612 (-9%)**	**2244 (-22%)**

2022 traffic demands in the AM at this junction are approximately 15% less than in 2019. Therefore, there is a reduced level of impact as a result of the four options modelled. As in 2019, there is still limited impact under Option 1 with negligible changes in throughput modelled.

The lane removal from Inchview Terrace in Option 2 has less of a baring under the 2022 scenario. The additional green time required to make up for the lane reduction can be recouped from the other junction arms that require less green time/capacity.

For Option 3, the lower traffic demand in 2022 allow for tweaks to traffic signal timings to be made, noticeably reducing the impacts on Portobello High Street and Sir Harry Lauder Road. Although a significant reduction in throughput is still anticipated from Inchview Terrace.

Impacts under Option 4 reduce in line with the overall reduction in traffic demand. However, throughput is still in excess of -40% from Inchview Terrace and Seafield Road East.

4.2.2 PM Model Analysis

Modelled throughput from the four medium term options are shown in Table 4.4 below for the 2019 PM peak hour.

Table 4.4: PM 2019 Modelled Throughput

Approach	Base	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Seafield Road East	1020	1030 (+1%)	1029 (+1%)	787 (-23%)	659 (-35%)
King's Road	37	38 (+3%)	38 (+3%)	38 (+3%)	37 (0%)
Portobello High Street	563	564 (0%)	559 (-1%)	547 (-3%)	419 (-26%)
Sir Harry Lauder Road	1137	1099 (-3%)	1066 (-6%)	880 (-23%)	696 (-39%)
Inchview Terrace	818	829 (+1%)	804 (-2%)	627 (-23%)	651 (-20%)
JUNCTION TOTAL	**3575**	**3560 (0%)**	**3496 (-2%)**	**2879 (-19%)**	**2462 (-31%)**

In terms of overall throughput, the options perform similarly in the PM peak hour as they did in the AM. A slight improvement was modelled under Options 1 and 2 where Seafield Road East and Sir Harry Lauder Road can operate at the same time. These are the junction arms with the highest traffic volumes so maximising green time for this traffic signal phase has a double benefit in terms of throughput.

The throughput impacts in the PM also tend to be more uniformly distributed across the junction arms compared to the AM. With the exception of King's Road, impacts are fairly balanced whereas in the AM they were more significantly felt on Inchview Terrace and Seafield Road East (in Option 3 and Option 4).

The PM peak hour modelled throughput under the 2022 demands scenario for the four options are shown below in Table 4.5.

Table 4.5: PM 2022 Modelled Throughput

Approach	Base	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Seafield Road East	869	869 (0%)	868 (0%)	689 (-21%)	652 (-25%)
King's Road	28	28 (0%)	28 (0%)	28 (0%)	28 (0%)
Portobello High Street	512	511 (0%)	511 (0%)	497 (-3%)	421 (-18%)
Sir Harry Lauder Road	1033	1033 (0%)	1028 (0%)	895 (-13%)	671 (-35%)
Inchview Terrace	819	819 (0%)	795 (-3%)	653 (-20%)	654 (-20%)
JUNCTION TOTAL	**3261**	**3260 (0%)**	**3230 (-1%)**	**2762 (-15%)**	**2426 (-26%)**

For the PM peak hour, observed traffic volumes at King's Road junction are approximately 7% less in 2022 compared to 2019. Under 2019 demands, Options 1 and 2 performed to a similar level as the Base and this is still the case assuming 2022 demands.

Throughput impacts under the 2022 scenario for Options 3 and 4 reduced by 4% and 5% respectively, which is in line with the observed traffic volumes. However, throughput is still in excess of -20% on a number of junction arms.

4.3 Queue Lengths

The analysis in this section of the report examines the potential queue lengths that might occur if the different junction options are implemented and traffic demands remain constant. In reality, if extensive queues were to arise vehicles would likely divert by an alternative route or travel at a different time of day to avoid the busiest

periods of the day. The analysis also does not take account of mode shift to public transport/active travel or traffic 'evaporation' where people choose not to travel at all. Conversely, it does not consider potential future traffic growth as a result of new development or induced traffic from possible neighbouring road closures or other restrictions.

4.3.1 AM Model Analysis

The potential AM additional queue lengths under the four options are displayed in Tables 4.6 and 4.7 respectively for the 2019 and 2022 demand scenarios. The queue lengths shown are on top of existing queues observed on street and are calculated by multiplying the change in throughput by an assumed average vehicle length of 5m (including the gap between vehicles).

Table 4.6: AM 2019 Modelled Queue Lengths

Approach	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Seafield Road East	-50m	-50m	-30m	+1900m
King's Road	+10m	+10m	+10m	0m
Portobello High Street	+45m	+280m	+1260m	+1195m
Sir Harry Lauder Road	+125m	+145m	+805m	+1070m
Inchview Terrace	-25m	+890m	+1180m	+1455m

Table 4.7: AM 2022 Modelled Queue Lengths

Approach	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Seafield Road East	0m	0m	-25m	+1415m
King's Road	0m	0m	0m	0m
Portobello High Street	0m	+15m	+240m	+120m
Sir Harry Lauder Road	0m	-240m	+260m	+415m
Inchview Terrace	+15m	+140m	+875m	+1240m

Option 1 has limited impact on queues under both demand scenarios. Option 2 could lead to significant queues if assuming 2019 demands only. 280m back from the junction on Portobello High Street is approximately to Fishwives' Causeway, while an 890m queue on Inchview Terrace would tailback passed Craigentinny Crescent.

Modelled queue lengths for Option 3 and Option 4 are in excess of 1195m on Portobello High Street, 805m on Sir Harry Lauder Road and 1180m on Inchview Terrace, using 2019 demands. These additional queue lengths drop below 420m on Portobello High Street and Sir Harry Lauder Road if 2022 demands are modelled. However, queues on Inchview Terrace are anticipated to be greater than 875m even assuming 2022 traffic levels.

The additional queue lengths for Option 4 (the longest modelled queue lengths) in the AM peak hour are displayed diagrammatically in Figure 4.1 below. The image shows queues from both demand scenarios with 2019 shown in blue and 2022 in red.

Figure 4.1: AM Option 4 Modelled Queue Lengths

4.3.2 PM Model Analysis

The potential PM queue lengths under the four options are displayed in Tables 4.8 and 4.9 respectively for the 2019 and 2022 demand scenarios. As with the AM, the queue lengths shown are in addition to existing queues observed on street and are calculated by multiplying the change in throughput by an assumed average vehicle length of 5m (including the gap between vehicles).

Table 4.8: PM 2019 Modelled Queue Lengths

Approach	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Seafield Road East	-50m	-45m	+1165m	+1805m
King's Road	-5m	-5m	-5m	0m
Portobello High Street	+5m	+20m	+80m	+720m
Sir Harry Lauder Road	+190m	+355m	+1285m	+2205m
Inchview Terrace	-55m	+70m	+955m	+835m

Table 4.9: PM 2022 Modelled Queue Lengths

Approach	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Seafield Road East	0m	+5m	+900m	+1085m
King's Road	0m	0m	0m	0m
Portobello High Street	-5m	+5m	+75m	+455m
Sir Harry Lauder Road	0m	+25m	+690m	+1810m
Inchview Terrace	0m	+120m	+830m	+825m

The 355m long additional queue (Option 2 2019) on Sir Harry Lauder Road is the only significant queue modelled for Options 1 and 2 in either of the demand scenarios. This queue would extend passed the junction with Fishwives Causeway.

For Option 3 and Option 4, modelled queues on Portobello High Street, Sir Harry Lauder Road and Inchview Terrace are greater than 690m in both the 2019 and 2022 scenarios, with four instances of queues exceeding 1100m assuming 2019 traffic volumes.

Queue lengths for Option 4 on Portobello High Street were modelled at over 720m under the 2019 scenario and over 455m under the 2022 scenario. The latter propagates back from the junction passed Adelphi Place.

The additional queue lengths modelled in the PM Option 4 under both scenarios are displayed diagrammatically in Figure 4.2 below. The 2019 demand scenario is shown in blue and the 2022 scenario in red.

Figure 4.2: PM Option 4 Modelled Queue Lengths

4.4 Average Journey Times

Journey times for all vehicle types (Car, Taxi, LGV, HGV and Bus) were recorded as part of the modelling assessment. The average time taken to travel 300m (200m for King's Road) on approach to the King's Road junction from each junction arm is analysed in this section of the report.

Note this is not the total time on approach to the junction, and if queues extend beyond 300m then delays encountered prior to this will not be taken into account in the model journey times.

4.4.1 AM Model Analysis

Modelled journey times for all vehicle types averaged across the AM peak hour are displayed in Table 4.10 below. The table shows journey times for the four medium term options under the 2019 demand scenario. The times are shown in minutes:seconds with the Base model included for reference.

Table 4.10: AM 2019 Average Journey Times

Approach	Base	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Sir Harry Lauder Road	0:59	0:58	3:16	3:52	3:59
Sir Harry Lauder Road – right turn	1:26	1:21	3:30	3:38	*Approach lane removed*
Inchview Terrace	1:24	1:36	5:26	6:22	7:27
Seafield Road East	0:59	0:57	0:53	1:48	11:49
Seafield Road East – right turn	1:28	1:18	1:20	2:13	8:15
King's Road	2:00	1:39	1:50	2:06	1:54
Portobello High Street	1:51	1:25	3:26	5:14	4:57

In general, as the level of change to the junction layout increases through the options, so do the approach times to the junction. Approach times in Option 1 are similar to the Base model with only a few seconds difference on all junction arms. The first noteworthy impacts occur under Option 2, with approach times increasing by over four minutes on Inchview Terrace, over two minutes on Sir Harry Lauder Road and one and a half minutes on Portobello High Street.

Approach times increase under Option 3 with almost five minutes additional delay on Inchview Terrace, almost three minutes on Sir Harry Lauder Road and over three minutes on Portobello High Street.

Delays continue to increase on Inchview Terrace and Sir Harry Lauder Road in Option 4. In addition, the necessary changes to the traffic signal staging under this option also now impact vehicles approaching the junction on Seafield Road East. Significant journey times were modelled on this arm, increasing from around one and a half minutes in the Base to over eleven and a half minutes.

Average approach times were also extracted from the 2022 traffic demand models. Table 4.11 below shows the modelled approach times on each junction arm, averaged across the AM peak hour assuming the 2022 demand scenario. The journey times displayed are in minutes:seconds.

Table 4.11: AM 2022 Average Journey Times

Approach	Base	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Sir Harry Lauder Road	0:56	0:56	1:57	4:03	4:02
Sir Harry Lauder Road – right turn	1:22	1:22	1:56	3:45	*Approach lane removed*
Inchview Terrace	1:22	1:22	3:16	6:08	7:48
Seafield Road East	0:57	0:57	0:55	1:09	12:25
Seafield Road East – right turn	1:30	1:30	1:32	2:20	8:50
King's Road	1:47	1:47	1:48	1:48	1:48
Portobello High Street	1:05	1:06	1:24	4:58	4:57

Due to the short length of the journey time routes, approach times under the 2022 scenario perform to a similar level as the 2019 scenario. Indicating that for most options queues are extending more than 300m.

The only option that has noticeably reduced approach times under the 2022 scenario compared to 2019 is Option 2. Delays on Inchview Terrace reduce by approximately two minutes, one to one and a half minutes on Sir Harry Lauder Road and two minutes on Portobello High Street.

4.4.2 PM Model Analysis

Average PM peak hour modelled journey times are shown in Table 4.12 for the 2019 demand scenario. The times are displayed in minutes:seconds for the Base model and the four medium term options.

Table 4.12: PM 2019 Average Journey Times

Approach	Base	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Sir Harry Lauder Road	1:00	0:58	2:22	4:38	4:34
Sir Harry Lauder Road – right turn	2:39	2:57	3:28	6:57	*Approach lane removed*
Inchview Terrace	1:34	1:25	2:28	4:12	4:06
Seafield Road East	1:09	1:11	1:20	5:21	6:33
Seafield Road East – right turn	1:09	1:24	1:24	5:17	5:21
King's Road	1:43	2:18	2:13	2:48	2:30
Portobello High Street	1:14	1:13	1:42	4:48	7:51

As with the AM peak, approach times generally increase as the level of intervention increases through the options and Option 1 performs similar to the Base model. More meaningful delays were modelled in Option 2 with vehicles on Inchview Terrace and straight ahead/left turning vehicles from Sir Harry Lauder Road facing additional delays over one minute. Vehicles approaching the junction on King's Road and Portobello High Street are delayed around 30 seconds from the Base model.

Removal of a southbound lane from Seafield Road East to Sir Harry Lauder in Options 3 leads to increased approach times from this arm. Modelling of Option 3 resulted in delays over four minutes on Seafield Road East and approach times increase between one minute and over four minutes on all other junction approach arms. These delays increase further to over five minutes under Option 4 for Seafield Road East and between one minute to six and half minutes on the other junction arms.

Table 4.13 below shows average approach times for the 2022 traffic demand scenario on each junction arm, averaged across the PM peak hour. The journey times displayed are in minutes:seconds.

Table 4.13: PM 2022 Average Journey Times

Approach	Base	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
Sir Harry Lauder Road	0:56	0:56	1:19	3:19	6:51
Sir Harry Lauder Road – right turn	1:55	1:55	2:19	5:28	*Approach lane removed*
Inchview Terrace	1:23	1:23	2:09	3:59	4:03
Seafield Road East	1:02	1:02	1:06	6:07	6:34
Seafield Road East – right turn	1:27	1:27	1:27	6:20	4:57
King's Road	2:43	2:43	2:35	2:39	2:39
Portobello High Street	1:09	1:10	1:32	3:16	7:53

Modelling of the 2022 demand scenario in the PM peak demonstrated almost no change between the Base and Option 1, as was the case with 2019 demands. Approach times in Option 2 are also similar to the Base with the maximum additional delays around 45 seconds on Inchview Terrace, which is a slight improvement compared to the 2019 demand scenario.

There are also minor approach time improvements for Option 3 using 2022 demands compared to 2019, with delays on five approaches improving by over one minute. Although approach times are still up to five minutes longer under Option 3 compared to the equivalent Base model.

Overall, there is no significant improvement for approach times under Option 4 when 2022 traffic data is used instead of 2019. Additional delays on all junction arms (excluding King's Road) were modelled to be between three and a half to six and a half minutes.

4.5 Impacts on Public Transport

King's Road junction is on a key public transport corridor with several buses per hour travelling in both directions between Portobello High Street and Inchview Terrace. Therefore, it is important to consider the impacts of the different option proposals on buses.

Table 4.14 summarises the modelling outputs from both the 2019 and 2022 demand scenarios on Portobello High Street for the AM an PM peak hours. The analysis focuses on the two key impacts on buses: the additional queue lengths on each junction arm and the additional delay on each approach.

Table 4.14: Portobello High Street Public Transport Impacts

	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
AM (08:00-09:00)				
2019 Additional Queue Lengths	+45m	+280m	+1260m	+1195m
2022 Additional Queue Lengths	0m	+15m	+240m	+120m
2019 Additional Delay on 300m Approach	-26 seconds	+1 minute 35 seconds	+3 minutes 23 seconds	+3 minutes 6 seconds
2022 Additional Delay on 300m Approach	+1 second	+19 seconds	+3 minutes 53 seconds	+3 minutes 52 seconds
PM (17:00-18:00)				
2019 Additional Queue Lengths	+5m	+20m	+80m	+720m
2022 Additional Queue Lengths	-5m	+5m	+75m	+455m
2019 Additional Delay on 300m Approach	-1 second	+28 seconds	+3 minutes 34 seconds	+6 minutes 37 seconds
2022 Additional Delay on 300m Approach	+1 second	+23 seconds	+2 minutes 7 seconds	+6 minutes 44 seconds

On Portobello High Street there is a bus lane approximately 150m back from the junction and due to queues, buses currently struggle to enter this lane and the bus stops located within it. The extensive queues modelled in Option 4 in both peaks and under both demand scenarios are likely to be unacceptable. The queue length in the AM Option 3 2019 demand scenario is also likely to be unacceptable.

The additional delays of over three minutes to travel 300m on approach to the junction modelled in Options 3 and 4 are likely to be faced with opposition from bus operators.

For the AM an PM peak hours Table 4.15 summarises the modelling outputs on Inchview Terrace from both the 2019 and 2022 demand scenarios. The analysis focuses on the two key impacts on buses: the additional queue lengths on each junction arm and the additional delay on each approach.

Table 4.15: Inchview Terrace Public Transport Impacts

	1: Do-Minimum	2: Two Phase Crossings	3: Single Crossings (3+1)	4: Single Crossings (2+2)
AM (08:00-09:00)				
2019 Additional Queue Lengths	-25m	+890m	+1180m	+1455m
2022 Additional Queue Lengths	+15m	+140m	+875m	+1240m
2019 Additional Delay on 300m Approach	+12 seconds	+4 minutes 2 seconds	+4 minutes 58 seconds	+6 minutes 3 seconds
2022 Additional Delay on 300m Approach	0 seconds	+1 minute 54 seconds	+3 minutes 46 seconds	+6 minutes 26 seconds
PM (17:00-18:00)				
2019 Additional Queue Lengths	-55m	+70m	+955m	+835m
2022 Additional Queue Lengths	0m	+120m	+830m	+825m
2019 Additional Delay on 300m Approach	-9 seconds	+54 seconds	+2 minutes 38 seconds	+2 minutes 32 seconds
2022 Additional Delay on 300m Approach	0 seconds	+46 seconds	+2 minutes 36 seconds	+2 minutes 40 seconds

The bus lane on Inchview Terrace begins approximately 330m in advance of the King's Road junction. Slight queues are already observed on street and it is anticipated that any additional queues of around 200m-250m is likely to prevent buses entering the bus lane. Queues far exceeding this were modelled in Options 3 and 4 in both demand scenarios, as well as AM Option 2 2019 scenario. This alongside the extra delays faced on approach to the junction are likely to be challenged by bus operators.

5. Summary

5.1 General Summary

Recent cycling fatalities on the Portobello High Street approach to the King's Road junction has led to a safety review of the junction to improve provision for vulnerable users. Jacobs have modelled the emerging medium term options using VISSIM microsimulation software in order to assess the potential impacts on general traffic and public transport of the proposed safety improvements.

Four medium term options have been developed by the Council. As the degree of cycle and pedestrian safety infrastructure increases through the options, so do the impacts on general traffic and public transport. The four options are summarised below:

- **Option 1: Do-Minimum** – removing the left turn filter lane from Portobello High Street to Sir Harry Lauder Road
- **Option 2: Segregated Cycle Route with Two Phase Crossing** – removing the left turn filter lanes from King's Road, Portobello High Street and Sir Harry Lauder Road and removal of the flare lane on Inchview Terrace in order to implement a designated cycle lane (including crossing) from Portobello High Street to Inchview Terrace
- **Option 3: Segregated Cycle Route with Single Phase Crossing (3+1 Traffic Lanes)** – as Option 2 but with single crossings instead of two phase crossings for pedestrians and cycles over King's Road, Portobello High Street, Sir Harry Lauder Road and Inchview Terrace
- **Option 4: Segregated Cycle Route with Single Phase Crossing (2+2 Traffic Lanes)** – as Option 3 but with only two lanes northbound on Sir Harry Lauder Road to provide more southbound capacity. The northbound right turn lane from Sir Harry Lauder Road is also removed

Modelling of the four options was undertaken in the AM and PM peak hours using two demand scenarios: 2019 which assumes traffic volumes will return to those pre-pandemic and 2022 assuming a 'new normal' has been reached in terms of traffic demands (future traffic growth or reduction was not assessed). Analysis focused on three modelling outputs: junction throughput, queue lengths and approach times to the junction, and highlighted key impacts on public transport services.

5.2 Option Performance Summary

One of the most evident outcomes from the modelling of the options is that Option 4 is unlikely to be deliverable in the near future assuming 2019 or 2022 traffic volumes. Under both demand scenarios, overall throughput reduces by over 22%, additional queue lengths can exceed 1400m and approach times can be in excess of eight minutes to travel 300m. This degree of impact on general traffic and bus services is unlikely to be acceptable in the medium term and therefore, it is not recommended to implement Option 4.

Another clear outcome from the modelling analysis is that Option 1 has minimal impact on general traffic and public transport under either demand scenario. The overall junction throughput does not reduce by more than 1%, additional queue lengths are all under 200m and approach times fluctuate by only a few seconds depending on the junction arm. In terms of traffic impacts, Option 1 could be implemented but it would be the role of decisionmakers to determine if the level of pedestrian and cycle safety infrastructure is sufficient in this option.

Option 2 is the next best performing option in terms of traffic impacts with only Inchview Terrace in the AM peak significantly affected. Assuming 2019 traffic demands, this arm of the junction has 29% less throughput, additional queues of 890m and around four minutes extra delay, which would all impact buses services on this corridor. However, these impacts reduce under the 2022 scenario with only a 5% reduction in throughput, 140m additional queues and around two minutes delay. To implement Option 2, it is likely that bus services on

Inchview Terrace would need to be monitored (particularly in the AM) and mitigation measures applied if significant delays to buses were observed.

The performance of Option 3 is more sensitive to the two different demand scenarios. Under the 2019 scenario, overall junction throughput reduces by 19%, with some queues exceeding 2000m and delays increase by more than four-five minutes on some junction arms. However, under the 2022 scenario overall throughput is -9% in the AM and -15% in the PM, with all queues under 900m. To implement Option 3, it is likely that strong support for the cycle and pedestrian safety improvements would be needed as there are likely to be significant impacts on general traffic and public transport. The level of these impacts, and deliverability of the scheme, will be dependent on future traffic volumes and whether they are likely to increase or decrease in the medium to long term.

Recent work undertaken by the Council, in developing Edinburgh's Circulation Plan, has identified the A199 Seafield Road East/Sir Harry Lauder Road as a Primary corridor and a key component of Edinburgh's strategic general traffic network. While significant traffic reduction (a target of 30%) is possible through the city centre and in local neighbourhoods, displaced traffic has the potential to result in much lower levels of traffic reduction on the A199 corridor. As such, any design for the King's Road junction must seek to minimise capacity reductions on this core route to avoid traffic rerouting back towards Portobello High Street and enabling more ambitious traffic reduction targets in neighbouring communities, which will derive greater benefit. However, the prioritisation of the A199 corridor cannot come at the expense of Inchview Terrace and Portobello High Street as this is an important public transport connection between Portobello and the east of the city. Therefore, at this complex junction with several competing needs, it is recommended that potential solutions for the King's Road junction aim to retain capacity where possible.

Appendix A. Full Calibration Results – Traffic Flows

Time	From	To	Taxis				Cars				LGV			
			Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
07:00-07:15	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Seafield Road East	King's Road	0	0	0	0	1	1	0	0	0	0	0	0
07:00-07:15	Seafield Road East	Portobello High Street	0	0	0	0	13	12	-1	0.28	4	4	0	0
07:00-07:15	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	49	49	0	0	13	13	0	0
07:00-07:15	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	1	1	0	0	3	3	0	0
07:00-07:15	King's Road	Seafield Road East	0	0	0	0	1	1	0	0	1	1	0	0
07:00-07:15	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	King's Road	Sir Harry Lauder Road	0	0	0	0	1	1	0	0	0	0	0	0
07:00-07:15	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Portobello High Street	Seafield Road East	0	0	0	0	58	55	-3	0.4	17	16	-1	0.25
07:00-07:15	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	12	12	0	0	3	3	0	0
07:00-07:15	Portobello High Street	Inchview Terrace/Portobello Road	2	2	0	0	40	38	-2	0.32	8	8	0	0
07:00-07:15	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	154	150	-4	0.32	27	26	-1	0.19
07:00-07:15	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	13	13	0	0	1	1	0	0
07:00-07:15	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	40	39	-1	0.16	13	13	0	0
07:00-07:15	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	4	4	0	0	2	2	0	0
07:00-07:15	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	10	10	0	0	0	0	0	0
07:00-07:15	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	33	31	-2	0.35	6	6	0	0
07:00-07:15	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Seafield Road East	King's Road	0	0	0	0	1	1	0	0	0	0	0	0
07:15-07:30	Seafield Road East	Portobello High Street	0	0	0	0	10	10	0	0	4	4	0	0
07:15-07:30	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	83	80	-3	0.33	21	21	0	0
07:15-07:30	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	6	5	-1	0.43	2	2	0	0
07:15-07:30	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	1	1	0	0	0	0	0	0
07:15-07:30	Portobello High Street	Seafield Road East	0	0	0	0	80	78	-2	0.23	18	18	0	0
07:15-07:30	Portobello High Street	King's Road	0	0	0	0	1	0	-1	1.41	1	0	-1	1.41
07:15-07:30	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	21	21	0	0	2	2	0	0
07:15-07:30	Portobello High Street	Inchview Terrace/Portobello Road	0	0	0	0	50	50	0	0	12	12	0	0
07:15-07:30	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	168	168	0	0	33	33	0	0
07:15-07:30	Sir Harry Lauder Road	King's Road	0	0	0	0	1	1	0	0	0	0	0	0
07:15-07:30	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	12	11	-1	0.29	5	5	0	0
07:15-07:30	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	75	74	-1	0.12	25	25	0	0
07:15-07:30	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	4	4	0	0	3	3	0	0
07:15-07:30	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	16	15	-1	0.25	4	4	0	0
07:15-07:30	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	43	43	0	0	6	6	0	0
07:15-07:30	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Seafield Road East	King's Road	0	0	0	0	1	1	0	0	1	1	0	0
07:30-07:45	Seafield Road East	Portobello High Street	0	0	0	0	24	24	0	0	4	4	0	0
07:30-07:45	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	95	94	-1	0.1	10	10	0	0
07:30-07:45	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	8	8	0	0	4	4	0	0
07:30-07:45	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	1	1	0	0
07:30-07:45	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	King's Road	Sir Harry Lauder Road	0	0	0	0	2	2	0	0	0	0	0	0
07:30-07:45	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	4	4	0	0	0	0	0	0
07:30-07:45	Portobello High Street	Seafield Road East	0	0	0	0	66	68	2	0.24	8	9	1	0.34
07:30-07:45	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	15	15	0	0	5	5	0	0
07:30-07:45	Portobello High Street	Inchview Terrace/Portobello Road	0	0	0	0	70	67	-3	0.36	12	12	0	0
07:30-07:45	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	155	152	-3	0.24	28	28	0	0
07:30-07:45	Sir Harry Lauder Road	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
07:30-07:45	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	3	4	1	0.53	5	5	0	0
07:30-07:45	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	109	108	-1	0.1	28	28	0	0
07:30-07:45	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	5	5	0	0	2	2	0	0
07:30-07:45	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
07:30-07:45	Inchview Terrace/Portobello Road	Portobello High Street	1	1	0	0	20	21	1	0.22	9	9	0	0
07:30-07:45	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	65	66	1	0.12	11	11	0	0
07:30-07:45	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Seafield Road East	King's Road	0	0	0	0	4	3	-1	0.53	1	1	0	0
07:45-08:00	Seafield Road East	Portobello High Street	0	0	0	0	20	20	0	0	6	6	0	0
07:45-08:00	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	103	103	0	0	24	24	0	0
07:45-08:00	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	10	10	0	0	2	2	0	0
07:45-08:00	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	1	1	0	0
07:45-08:00	King's Road	Sir Harry Lauder Road	0	0	0	0	1	1	0	0	0	0	0	0
07:45-08:00	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Portobello High Street	Seafield Road East	2	1	-1	0.82	65	51	-14	1.84	7	5	-2	0.82
07:45-08:00	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	1	0	-1	1.41
07:45-08:00	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	19	14	-5	1.23	3	3	0	0
07:45-08:00	Portobello High Street	Inchview Terrace/Portobello Road	4	3	-1	0.53	81	60	-21	2.5	20	15	-5	1.2
07:45-08:00	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	153	153	0	0	23	23	0	0
07:45-08:00	Sir Harry Lauder Road	King's Road	0	0	0	0	6	6	0	0	0	0	0	0
07:45-08:00	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	17	17	0	0	5	5	0	0
07:45-08:00	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	87	88	1	0.11	32	32	0	0
07:45-08:00	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	10	10	0	0	3	3	0	0
07:45-08:00	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	2	2	0	0	1	1	0	0
07:45-08:00	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	32	30	-2	0.36	7	7	0	0
07:45-08:00	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	88	85	-3	0.32	8	8	0	0
07:45-08:00	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0

Table A.1 Validation to Traffic Flows - Taxis, Cars and LGV - 07:00-08:00

Time	From	To	HGV				Bus+Coach				Cycles			
			Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
07:00-07:15	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Seafield Road East	Portobello High Street	1	1	0	0	1	1	0	0	0	0	0	0
07:00-07:15	Seafield Road East	Sir Harry Lauder Road	3	3	0	0	4	4	0	0	0	0	0	0
07:00-07:15	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	10	10	0	0	0	0	0	0
07:00-07:15	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	1	1	0	0
07:00-07:15	Portobello High Street	Seafield Road East	2	2	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Portobello High Street	Inchview Terrace/Portobello Road	1	1	0	0	3	3	0	0	2	2	0	0
07:00-07:15	Sir Harry Lauder Road	Seafield Road East	7	7	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	4	4	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	1	1	0	0	0	0	0	0
07:00-07:15	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	1	1	0	0
07:00-07:15	Inchview Terrace/Portobello Road	Portobello High Street	1	1	0	0	2	2	0	0	0	0	0	0
07:00-07:15	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	2	2	0	0	0	0	0	0	0	0	0	0
07:00-07:15	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Seafield Road East	Portobello High Street	1	1	0	0	2	2	0	0	1	1	0	0
07:15-07:30	Seafield Road East	Sir Harry Lauder Road	3	3	0	0	4	4	0	0	0	0	0	0
07:15-07:30	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	5	5	0	0	0	0	0	0
07:15-07:30	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Portobello High Street	Seafield Road East	1	1	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Portobello High Street	Sir Harry Lauder Road	1	1	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Portobello High Street	Inchview Terrace/Portobello Road	0	0	0	0	4	4	0	0	0	0	0	0
07:15-07:30	Sir Harry Lauder Road	Seafield Road East	9	9	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	5	5	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	2	2	0	0	0	0	0	0
07:15-07:30	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	2	2	0	0
07:15-07:30	Inchview Terrace/Portobello Road	Portobello High Street	1	1	0	0	2	2	0	0	0	0	0	0
07:15-07:30	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	1	1	0	0	0	0	0	0	0	0	0	0
07:15-07:30	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Seafield Road East	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Seafield Road East	Sir Harry Lauder Road	10	10	0	0	3	3	0	0	0	0	0	0
07:30-07:45	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	4	4	0	0	0	0	0	0
07:30-07:45	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	1	1	0	0
07:30-07:45	Portobello High Street	Seafield Road East	2	2	0	0	1	1	0	0	0	0	0	0
07:30-07:45	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Portobello High Street	Inchview Terrace/Portobello Road	0	0	0	0	5	5	0	0	5	4	-1	0.47
07:30-07:45	Sir Harry Lauder Road	Seafield Road East	8	8	0	0	1	1	0	0	1	1	0	0
07:30-07:45	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	1	1	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Inchview Terrace/Portobello Road	Seafield Road East	1	1	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	1	1	0	0
07:30-07:45	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	4	4	0	0	0	0	0	0
07:30-07:45	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	6	6	0	0	0	0	0	0	0	0	0	0
07:30-07:45	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Seafield Road East	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Seafield Road East	Sir Harry Lauder Road	2	2	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	3	3	0	0	0	0	0	0
07:45-08:00	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	1	1	0	0
07:45-08:00	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Portobello High Street	Seafield Road East	2	1	-1	0.82	0	0	0	0	0	0	0	0
07:45-08:00	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Portobello High Street	Inchview Terrace/Portobello Road	2	2	0	0	4	4	0	0	1	1	0	0
07:45-08:00	Sir Harry Lauder Road	Seafield Road East	5	5	0	0	3	3	0	0	2	2	0	0
07:45-08:00	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	5	5	0	0	1	1	0	0	0	0	0	0
07:45-08:00	Inchview Terrace/Portobello Road	Seafield Road East	2	2	0	0	1	1	0	0	0	0	0	0
07:45-08:00	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	2	1	-1	0.82
07:45-08:00	Inchview Terrace/Portobello Road	Portobello High Street	1	1	0	0	3	3	0	0	0	0	0	0
07:45-08:00	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	5	5	0	0	0	0	0	0	0	0	0	0
07:45-08:00	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0

Table A.2 Validation to Traffic Flows – HGV, Bus&Coach, Cycles - 07:00-08:00

Time	From	To	Taxis				Cars				LGV			
			Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
08:00-08:15	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Seafield Road East	King's Road	0	0	0	0	0	1	1	1.41	0	0	0	0
08:00-08:15	Seafield Road East	Portobello High Street	0	0	0	0	24	24	0	0	11	11	0	0
08:00-08:15	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	136	138	2	0.17	19	19	0	0
08:00-08:15	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	7	7	0	0	4	4	0	0
08:00-08:15	King's Road	Seafield Road East	0	0	0	0	2	1	-1	0.82	1	1	0	0
08:00-08:15	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	King's Road	Portobello High Street	0	0	0	0	1	1	0	0	0	0	0	0
08:00-08:15	King's Road	Sir Harry Lauder Road	0	0	0	0	1	1	0	0	0	0	0	0
08:00-08:15	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	2	2	0	0	0	0	0	0
08:00-08:15	Portobello High Street	Seafield Road East	0	1	1	1.41	57	57	0	0	6	6	0	0
08:00-08:15	Portobello High Street	King's Road	0	0	0	0	1	0	-1	1.41	1	0	-1	1.41
08:00-08:15	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	14	15	1	0.26	4	2	-2	1.15
08:00-08:15	Portobello High Street	Inchview Terrace/Portobello Road	2	2	0	0	61	66	5	0.63	14	15	1	0.26
08:00-08:15	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	150	152	2	0.16	21	21	0	0
08:00-08:15	Sir Harry Lauder Road	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
08:00-08:15	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	12	11	-1	0.29	3	3	0	0
08:00-08:15	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	1	1	0	0	91	91	0	0	13	14	1	0.27
08:00-08:15	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	9	8	-1	0.34	1	1	0	0
08:00-08:15	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
08:00-08:15	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	33	33	0	0	5	5	0	0
08:00-08:15	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	2	2	0	0	60	62	2	0.26	8	8	0	0
08:00-08:15	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Seafield Road East	King's Road	0	0	0	0	3	3	0	0	0	0	0	0
08:15-08:30	Seafield Road East	Portobello High Street	0	0	0	0	27	27	0	0	3	3	0	0
08:15-08:30	Seafield Road East	Sir Harry Lauder Road	1	1	0	0	111	110	-1	0.1	19	19	0	0
08:15-08:30	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	10	11	1	0.31	3	3	0	0
08:15-08:30	King's Road	Seafield Road East	0	0	0	0	1	1	0	0	0	0	0	0
08:15-08:30	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	King's Road	Sir Harry Lauder Road	0	0	0	0	2	2	0	0	0	0	0	0
08:15-08:30	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Portobello High Street	Seafield Road East	0	0	0	0	87	74	-13	1.45	8	7	-1	0.37
08:15-08:30	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	1	0	-1	1.41
08:15-08:30	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	29	21	-8	1.6	2	4	2	1.15
08:15-08:30	Portobello High Street	Inchview Terrace/Portobello Road	2	2	0	0	77	66	-11	1.3	7	8	1	0.37
08:15-08:30	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	119	119	0	0	15	16	1	0.25
08:15-08:30	Sir Harry Lauder Road	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
08:15-08:30	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	13	14	1	0.27	7	6	-1	0.39
08:15-08:30	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	1	1	0	0	84	83	-1	0.11	18	18	0	0
08:15-08:30	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	6	6	0	0	1	1	0	0
08:15-08:30	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Inchview Terrace/Portobello Road	Portobello High Street	2	2	0	0	34	34	0	0	6	6	0	0
08:15-08:30	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	102	97	-5	0.5	17	16	-1	0.25
08:15-08:30	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Seafield Road East	King's Road	0	0	0	0	1	1	0	0	0	0	0	0
08:30-08:45	Seafield Road East	Portobello High Street	0	0	0	0	25	24	-1	0.2	6	6	0	0
08:30-08:45	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	92	92	0	0	16	16	0	0
08:30-08:45	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	7	6	-1	0.39	3	3	0	0
08:30-08:45	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	1	1	0	0
08:30-08:45	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	King's Road	Portobello High Street	0	0	0	0	2	2	0	0	0	0	0	0
08:30-08:45	King's Road	Sir Harry Lauder Road	0	0	0	0	1	1	0	0	0	0	0	0
08:30-08:45	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	4	4	0	0	1	1	0	0
08:30-08:45	Portobello High Street	Seafield Road East	1	1	0	0	67	65	-2	0.25	5	6	1	0.43
08:30-08:45	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	1	0	-1	1.41
08:30-08:45	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	14	19	5	1.23	3	2	-1	0.63
08:30-08:45	Portobello High Street	Inchview Terrace/Portobello Road	1	1	0	0	63	62	-1	0.13	14	10	-4	1.15
08:30-08:45	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	139	139	0	0	17	16	-1	0.25
08:30-08:45	Sir Harry Lauder Road	King's Road	0	0	0	0	2	2	0	0	1	1	0	0
08:30-08:45	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	18	17	-1	0.24	5	5	0	0
08:30-08:45	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	89	88	-1	0.11	12	12	0	0
08:30-08:45	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	7	7	0	0	6	6	0	0
08:30-08:45	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	1	1	0	0	0	0	0	0
08:30-08:45	Inchview Terrace/Portobello Road	Portobello High Street	2	2	0	0	41	42	1	0.16	5	5	0	0
08:30-08:45	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	1	1	0	0	69	72	3	0.36	13	14	1	0.27
08:30-08:45	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Seafield Road East	King's Road	0	0	0	0	3	3	0	0	0	0	0	0
08:45-09:00	Seafield Road East	Portobello High Street	0	0	0	0	28	28	0	0	3	4	1	0.53
08:45-09:00	Seafield Road East	Sir Harry Lauder Road	1	1	0	0	112	106	-6	0.57	10	10	0	0
08:45-09:00	Seafield Road East	Inchview Terrace/Portobello Road	1	1	0	0	5	5	0	0	2	2	0	0
08:45-09:00	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	1	1	0	0
08:45-09:00	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	King's Road	Portobello High Street	0	0	0	0	1	1	0	0	0	0	0	0
08:45-09:00	King's Road	Sir Harry Lauder Road	0	0	0	0	2	2	0	0	0	0	0	0
08:45-09:00	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Portobello High Street	Seafield Road East	2	1	-1	0.82	62	62	0	0	9	6	-3	1.1
08:45-09:00	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	24	16	-8	1.79	4	4	0	0
08:45-09:00	Portobello High Street	Inchview Terrace/Portobello Road	0	1	1	1.41	71	56	-15	1.88	9	12	3	0.93
08:45-09:00	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	129	121	-8	0.72	30	29	-1	0.18
08:45-09:00	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	30	28	-2	0.37	3	3	0	0
08:45-09:00	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	1	1	0	0	80	80	0	0	18	17	-1	0.24
08:45-09:00	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	7	7	0	0	6	6	0	0
08:45-09:00	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	2	2	0	0
08:45-09:00	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	42	39	-3	0.47	7	6	-1	0.39
08:45-09:00	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	1	1	0	0	64	62	-2	0.25	15	14	-1	0.26
08:45-09:00	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0

Table A.3 Validation to Traffic Flows - Taxis, Cars and LGV - 08:00-09:00

Time	From	To	HGV				Bus+Coach				Cycles			
			Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
08:00-08:15	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Seafield Road East	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Seafield Road East	Sir Harry Lauder Road	8	8	0	0	1	1	0	0	0	0	0	0
08:00-08:15	Seafield Road East	Inchview Terrace/Portobello Road	2	2	0	0	1	1	0	0	0	0	0	0
08:00-08:15	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	King's Road	Sir Harry Lauder Road	1	1	0	0	0	0	0	0	0	0	0	0
08:00-08:15	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Portobello High Street	Seafield Road East	1	1	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Portobello High Street	King's Road	1	0	-1	1.41	0	0	0	0	0	0	0	0
08:00-08:15	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Portobello High Street	Sir Harry Lauder Road	2	1	-1	0.82	0	0	0	0	0	0	0	0
08:00-08:15	Portobello High Street	Inchview Terrace/Portobello Road	0	0	0	0	5	4	-1	0.47	0	1	1	1.41
08:00-08:15	Sir Harry Lauder Road	Seafield Road East	6	6	0	0	0	0	0	0	1	1	0	0
08:00-08:15	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	3	3	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Inchview Terrace/Portobello Road	Seafield Road East	1	1	0	0	2	2	0	0	0	0	0	0
08:00-08:15	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	2	3	1	0.63
08:00-08:15	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	5	5	0	0	2	2	0	0
08:00-08:15	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	5	5	0	0	0	0	0	0	0	0	0	0
08:00-08:15	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Seafield Road East	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Seafield Road East	Sir Harry Lauder Road	7	7	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Seafield Road East	Inchview Terrace/Portobello Road	1	1	0	0	6	6	0	0	0	0	0	0
08:15-08:30	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	1	1	0	0
08:15-08:30	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	2	2	0	0
08:15-08:30	Portobello High Street	Seafield Road East	1	0	-1	1.41	0	0	0	0	0	0	0	0
08:15-08:30	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Portobello High Street	Sir Harry Lauder Road	0	1	1	1.41	0	0	0	0	0	0	0	0
08:15-08:30	Portobello High Street	Inchview Terrace/Portobello Road	0	0	0	0	9	6	-3	1.1	3	2	-1	0.63
08:15-08:30	Sir Harry Lauder Road	Seafield Road East	14	13	-1	0.27	0	0	0	0	0	0	0	0
08:15-08:30	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	1	1	0	0	1	1	0	0	0	0	0	0
08:15-08:30	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	2	2	0	0	0	0	0	0
08:15-08:30	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	1	1	0	0
08:15-08:30	Inchview Terrace/Portobello Road	Portobello High Street	1	1	0	0	2	2	0	0	0	0	0	0
08:15-08:30	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	2	2	0	0	0	0	0	0	0	0	0	0
08:15-08:30	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Seafield Road East	Portobello High Street	0	0	0	0	1	1	0	0	0	0	0	0
08:30-08:45	Seafield Road East	Sir Harry Lauder Road	8	8	0	0	1	1	0	0	0	0	0	0
08:30-08:45	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	9	9	0	0	0	0	0	0
08:30-08:45	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	1	1	0	0
08:30-08:45	Portobello High Street	Seafield Road East	1	1	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Portobello High Street	Sir Harry Lauder Road	1	1	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Portobello High Street	Inchview Terrace/Portobello Road	1	1	0	0	5	6	1	0.43	1	1	0	0
08:30-08:45	Sir Harry Lauder Road	Seafield Road East	12	12	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	3	3	0	0	2	2	0	0	1	1	0	0
08:30-08:45	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	2	2	0	0	0	0	0	0
08:30-08:45	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	8	8	0	0	0	0	0	0
08:30-08:45	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	5	5	0	0	0	0	0	0	0	0	0	0
08:30-08:45	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Seafield Road East	Portobello High Street	2	2	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Seafield Road East	Sir Harry Lauder Road	10	9	-1	0.32	0	0	0	0	0	0	0	0
08:45-09:00	Seafield Road East	Inchview Terrace/Portobello Road	1	1	0	0	7	6	-1	0.39	0	0	0	0
08:45-09:00	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Portobello High Street	Seafield Road East	0	1	1	1.41	0	0	0	0	0	0	0	0
08:45-09:00	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Portobello High Street	Sir Harry Lauder Road	2	1	-1	0.82	0	0	0	0	0	0	0	0
08:45-09:00	Portobello High Street	Inchview Terrace/Portobello Road	1	1	0	0	5	5	0	0	3	2	-1	0.63
08:45-09:00	Sir Harry Lauder Road	Seafield Road East	5	5	0	0	2	2	0	0	1	1	0	0
08:45-09:00	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Sir Harry Lauder Road	Portobello High Street	2	2	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	5	5	0	0	1	1	0	0	0	0	0	0
08:45-09:00	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	3	3	0	0	0	0	0	0
08:45-09:00	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Inchview Terrace/Portobello Road	Portobello High Street	2	2	0	0	2	2	0	0	1	1	0	0
08:45-09:00	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0

Table A.4 Validation to Traffic Flows - HGV, Bus&Coach, Cycles - 08:00-09:00

Time	From	To	Taxis				Cars				LGV			
			Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
16:00-16:15	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Seafield Road East	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
16:00-16:15	Seafield Road East	Portobello High Street	1	1	0	0	52	49	-3	0.42	7	7	0	0
16:00-16:15	Seafield Road East	Sir Harry Lauder Road	1	1	0	0	139	133	-6	0.51	25	23	-2	0.41
16:00-16:15	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	5	5	0	0	4	4	0	0
16:00-16:15	King's Road	Seafield Road East	0	0	0	0	2	2	0	0	0	0	0	0
16:00-16:15	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	King's Road	Sir Harry Lauder Road	0	0	0	0	2	2	0	0	0	0	0	0
16:00-16:15	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	3	3	0	0	0	0	0	0
16:00-16:15	Portobello High Street	Seafield Road East	1	1	0	0	44	40	-4	0.62	7	6	-1	0.39
16:00-16:15	Portobello High Street	King's Road	0	0	0	0	2	0	-2	2	0	0	0	0
16:00-16:15	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	33	24	-9	1.69	2	2	0	0
16:00-16:15	Portobello High Street	Inchview Terrace/Portobello Road	1	1	0	0	47	39	-8	1.22	7	6	-1	0.39
16:00-16:15	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	99	96	-3	0.3	13	12	-1	0.28
16:00-16:15	Sir Harry Lauder Road	King's Road	0	0	0	0	3	3	0	0	1	1	0	0
16:00-16:15	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	35	33	-2	0.34	2	2	0	0
16:00-16:15	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	77	75	-2	0.23	9	9	0	0
16:00-16:15	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	9	9	0	0	0	0	0	0
16:00-16:15	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Inchview Terrace/Portobello Road	Portobello High Street	1	1	0	0	85	82	-3	0.33	10	10	0	0
16:00-16:15	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	1	1	0	0	89	85	-4	0.43	13	12	-1	0.28
16:00-16:15	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Seafield Road East	Portobello High Street	0	0	0	0	43	44	1	0.15	9	9	0	0
16:15-16:30	Seafield Road East	Sir Harry Lauder Road	1	1	0	0	135	134	-1	0.09	23	23	0	0
16:15-16:30	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	9	8	-1	0.34	1	1	0	0
16:15-16:30	King's Road	Seafield Road East	0	0	0	0	2	2	0	0	0	0	0	0
16:15-16:30	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	King's Road	Portobello High Street	0	0	0	0	1	1	0	0	1	1	0	0
16:15-16:30	King's Road	Sir Harry Lauder Road	0	0	0	0	1	1	0	0	0	0	0	0
16:15-16:30	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	2	2	0	0	0	0	0	0
16:15-16:30	Portobello High Street	Seafield Road East	2	1	-1	0.82	42	35	-7	1.13	6	5	-1	0.43
16:15-16:30	Portobello High Street	King's Road	0	0	0	0	1	0	-1	1.41	0	0	0	0
16:15-16:30	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	25	24	-1	0.2	7	4	-3	1.28
16:15-16:30	Portobello High Street	Inchview Terrace/Portobello Road	2	1	-1	0.82	42	32	-10	1.64	6	5	-1	0.43
16:15-16:30	Sir Harry Lauder Road	Seafield Road East	1	1	0	0	109	108	-1	0.1	17	17	0	0
16:15-16:30	Sir Harry Lauder Road	King's Road	0	0	0	0	4	3	-1	0.53	0	0	0	0
16:15-16:30	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	45	40	-5	0.77	4	3	-1	0.53
16:15-16:30	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	84	85	1	0.11	10	10	0	0
16:15-16:30	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	7	7	0	0	2	2	0	0
16:15-16:30	Inchview Terrace/Portobello Road	King's Road	1	1	0	0	2	2	0	0	0	0	0	0
16:15-16:30	Inchview Terrace/Portobello Road	Portobello High Street	4	4	0	0	71	69	-2	0.24	15	14	-1	0.26
16:15-16:30	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	84	83	-1	0.11	19	20	1	0.23
16:15-16:30	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Seafield Road East	King's Road	0	0	0	0	1	1	0	0	0	0	0	0
16:30-16:45	Seafield Road East	Portobello High Street	0	0	0	0	54	52	-2	0.27	6	6	0	0
16:30-16:45	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	157	157	0	0	18	18	0	0
16:30-16:45	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	10	10	0	0	2	2	0	0
16:30-16:45	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	King's Road	Portobello High Street	1	1	0	0	2	2	0	0	0	0	0	0
16:30-16:45	King's Road	Sir Harry Lauder Road	0	0	0	0	2	2	0	0	0	0	0	0
16:30-16:45	King's Road	Inchview Terrace/Portobello Road	1	1	0	0	6	6	0	0	1	1	0	0
16:30-16:45	Portobello High Street	Seafield Road East	2	2	0	0	26	23	-3	0.61	5	5	0	0
16:30-16:45	Portobello High Street	King's Road	0	0	0	0	1	0	-1	1.41	1	0	-1	1.41
16:30-16:45	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Portobello High Street	Sir Harry Lauder Road	1	0	-1	1.41	31	21	-10	1.96	2	3	1	0.63
16:30-16:45	Portobello High Street	Inchview Terrace/Portobello Road	4	3	-1	0.53	40	34	-6	0.99	2	3	1	0.63
16:30-16:45	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	60	60	0	0	6	6	0	0
16:30-16:45	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	31	33	2	0.35	3	4	1	0.53
16:30-16:45	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	1	1	0	0	38	38	0	0	8	8	0	0
16:30-16:45	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	5	5	0	0	2	2	0	0
16:30-16:45	Inchview Terrace/Portobello Road	King's Road	1	1	0	0	2	2	0	0	0	0	0	0
16:30-16:45	Inchview Terrace/Portobello Road	Portobello High Street	5	5	0	0	81	82	1	0.11	13	13	0	0
16:30-16:45	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	77	80	3	0.34	15	15	0	0
16:30-16:45	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Seafield Road East	Portobello High Street	0	0	0	0	99	100	1	0.1	6	6	0	0
16:45-17:00	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	137	141	4	0.34	13	14	1	0.27
16:45-17:00	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	3	3	0	0	2	2	0	0
16:45-17:00	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	1	1	0	0	0	0	0	0
16:45-17:00	Portobello High Street	Seafield Road East	5	3	-2	1	36	27	-9	1.6	9	5	-4	1.51
16:45-17:00	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Portobello High Street	Sir Harry Lauder Road	0	1	1	1.41	19	24	5	1.08	2	2	0	0
16:45-17:00	Portobello High Street	Inchview Terrace/Portobello Road	2	3	1	0.63	39	31	-8	1.35	2	1	-1	0.82
16:45-17:00	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	67	69	2	0.24	6	6	0	0
16:45-17:00	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	26	27	1	0.19	5	5	0	0
16:45-17:00	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	43	42	-1	0.15	8	8	0	0
16:45-17:00	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	10	10	0	0	1	1	0	0
16:45-17:00	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
16:45-17:00	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	69	69	0	0	13	12	-1	0.28
16:45-17:00	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	63	62	-1	0.13	19	19	0	0
16:45-17:00	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0

Table A.5 Validation to Traffic Flows - Taxis, Cars and LGV - 16:00-17:00

Time	From	To	HGV				Bus+Coach				Cycles			
			Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
16:00-16:15	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Seafield Road East	Portobello High Street	0	0	0	0	1	1	0	0	2	2	0	0
16:00-16:15	Seafield Road East	Sir Harry Lauder Road	5	5	0	0	2	2	0	0	0	0	0	0
16:00-16:15	Seafield Road East	Inchview Terrace/Portobello Road	2	2	0	0	2	2	0	0	0	0	0	0
16:00-16:15	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Portobello High Street	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	1	1	0	0	0	0	0	0
16:00-16:15	Portobello High Street	Inchview Terrace/Portobello Road	0	0	0	0	4	3	-1	0.53	1	1	0	0
16:00-16:15	Sir Harry Lauder Road	Seafield Road East	7	7	0	0	1	1	0	0	0	0	0	0
16:00-16:15	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	1	1	0	0
16:00-16:15	Inchview Terrace/Portobello Road	Seafield Road East	1	1	0	0	1	1	0	0	0	0	0	0
16:00-16:15	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Inchview Terrace/Portobello Road	Portobello High Street	2	2	0	0	4	4	0	0	1	1	0	0
16:00-16:15	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	2	2	0	0	0	0	0	0	0	0	0	0
16:00-16:15	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Seafield Road East	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Seafield Road East	Sir Harry Lauder Road	6	6	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	2	2	0	0	0	0	0	0
16:15-16:30	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Portobello High Street	Seafield Road East	0	0	0	0	1	1	0	0	0	0	0	0
16:15-16:30	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Portobello High Street	Inchview Terrace/Portobello Road	0	0	0	0	5	3	-2	1	1	0	-1	1.41
16:15-16:30	Sir Harry Lauder Road	Seafield Road East	1	1	0	0	1	1	0	0	0	0	0	0
16:15-16:30	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	2	2	0	0	0	0	0	0
16:15-16:30	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	2	2	0	0	0	0	0	0
16:15-16:30	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Inchview Terrace/Portobello Road	Portobello High Street	1	1	0	0	2	2	0	0	4	3	-1	0.53
16:15-16:30	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	2	2	0	0	0	0	0	0	0	0	0	0
16:15-16:30	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Seafield Road East	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Seafield Road East	Sir Harry Lauder Road	4	4	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	4	4	0	0	0	0	0	0
16:30-16:45	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	1	1	0	0
16:30-16:45	Portobello High Street	Seafield Road East	1	0	-1	1.41	1	1	0	0	0	0	0	0
16:30-16:45	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	1	0	-1	1.41	0	0	0	0
16:30-16:45	Portobello High Street	Inchview Terrace/Portobello Road	1	0	-1	1.41	3	3	0	0	3	2	-1	0.63
16:30-16:45	Sir Harry Lauder Road	Seafield Road East	1	1	0	0	1	1	0	0	0	0	0	0
16:30-16:45	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	1	1	0	0	0	0	0	0
16:30-16:45	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Inchview Terrace/Portobello Road	King's Road	1	1	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	5	4	-1	0.47	1	2	1	0.82
16:30-16:45	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	5	5	0	0	0	0	0	0	0	0	0	0
16:30-16:45	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Seafield Road East	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Seafield Road East	Sir Harry Lauder Road	2	2	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Seafield Road East	Inchview Terrace/Portobello Road	1	1	0	0	4	4	0	0	0	0	0	0
16:45-17:00	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Portobello High Street	Seafield Road East	0	1	1	1.41	0	1	1	1.41	0	0	0	0
16:45-17:00	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	0	1	1	1.41	0	0	0	0
16:45-17:00	Portobello High Street	Inchview Terrace/Portobello Road	0	1	1	1.41	5	4	-1	0.47	1	2	1	0.82
16:45-17:00	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	1	1	0	0	0	0	0	0	0	0	0	0
16:45-17:00	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	2	2	0	0	0	0	0	0
16:45-17:00	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	5	4	-1	0.47
16:45-17:00	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	5	5	0	0	1	1	0	0
16:45-17:00	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	1	1	1.41	0	0	0	0	0	0	0	0
16:45-17:00	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0

Table A.6 Validation to Traffic Flows – HGV, Bus&Coach, Cycles - 16:00-17:00

Time	From	To	Taxis				Cars				LGV			
			Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
17:00-17:15	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Seafield Road East	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
17:00-17:15	Seafield Road East	Portobello High Street	1	1	0	0	71	70	-1	0.12	6	6	0	0
17:00-17:15	Seafield Road East	Sir Harry Lauder Road	1	1	0	0	163	157	-6	0.47	17	16	-1	0.25
17:00-17:15	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	8	8	0	0	2	2	0	0
17:00-17:15	King's Road	Seafield Road East	0	0	0	0	2	2	0	0	0	0	0	0
17:00-17:15	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	King's Road	Portobello High Street	0	0	0	0	1	1	0	0	1	1	0	0
17:00-17:15	King's Road	Sir Harry Lauder Road	0	0	0	0	3	3	0	0	1	1	0	0
17:00-17:15	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	5	5	0	0	0	0	0	0
17:00-17:15	Portobello High Street	Seafield Road East	1	3	2	1.41	52	35	-17	2.58	5	7	2	0.82
17:00-17:15	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	31	20	-11	2.18	1	2	1	0.82
17:00-17:15	Portobello High Street	Inchview Terrace/Portobello Road	1	1	0	0	46	36	-10	1.56	8	2	-6	2.68
17:00-17:15	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	117	113	-4	0.37	10	10	0	0
17:00-17:15	Sir Harry Lauder Road	King's Road	0	0	0	0	1	1	0	0	0	0	0	0
17:00-17:15	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	28	27	-1	0.19	1	1	0	0
17:00-17:15	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	1	1	0	0	85	85	0	0	7	7	0	0
17:00-17:15	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	5	5	0	0	1	1	0	0
17:00-17:15	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
17:00-17:15	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	88	89	1	0.11	8	9	1	0.34
17:00-17:15	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	74	74	0	0	12	12	0	0
17:00-17:15	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Seafield Road East	King's Road	0	0	0	0	1	1	0	0	2	2	0	0
17:15-17:30	Seafield Road East	Portobello High Street	0	0	0	0	68	70	2	0.24	2	2	0	0
17:15-17:30	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	154	157	3	0.24	15	16	1	0.25
17:15-17:30	Seafield Road East	Inchview Terrace/Portobello Road	1	1	0	0	5	5	0	0	1	1	0	0
17:15-17:30	King's Road	Seafield Road East	0	0	0	0	3	3	0	0	0	0	0	0
17:15-17:30	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	King's Road	Portobello High Street	0	0	0	0	1	1	0	0	0	0	0	0
17:15-17:30	King's Road	Sir Harry Lauder Road	0	0	0	0	1	1	0	0	0	0	0	0
17:15-17:30	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	2	2	0	0	0	0	0	0
17:15-17:30	Portobello High Street	Seafield Road East	5	1	-4	2.31	60	37	-23	3.3	0	4	4	2.83
17:15-17:30	Portobello High Street	King's Road	0	0	0	0	1	0	-1	1.41	0	0	0	0
17:15-17:30	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	25	22	-3	0.62	2	1	-1	0.82
17:15-17:30	Portobello High Street	Inchview Terrace/Portobello Road	1	1	0	0	35	35	0	0	9	6	-3	1.1
17:15-17:30	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	168	166	-2	0.15	15	15	0	0
17:15-17:30	Sir Harry Lauder Road	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
17:15-17:30	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	35	33	-2	0.34	3	3	0	0
17:15-17:30	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	1	1	0	0	84	84	0	0	8	8	0	0
17:15-17:30	Inchview Terrace/Portobello Road	Seafield Road East	3	3	0	0	7	7	0	0	4	3	-1	0.53
17:15-17:30	Inchview Terrace/Portobello Road	King's Road	1	1	0	0	3	3	0	0	1	1	0	0
17:15-17:30	Inchview Terrace/Portobello Road	Portobello High Street	2	2	0	0	73	70	-3	0.35	5	4	-1	0.47
17:15-17:30	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	92	87	-5	0.53	11	10	-1	0.31
17:15-17:30	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Seafield Road East	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
17:30-17:45	Seafield Road East	Portobello High Street	0	0	0	0	53	51	-2	0.28	2	2	0	0
17:30-17:45	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	154	153	-1	0.08	11	11	0	0
17:30-17:45	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	7	7	0	0	0	0	0	0
17:30-17:45	King's Road	Seafield Road East	0	0	0	0	1	1	0	0	0	0	0	0
17:30-17:45	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	King's Road	Portobello High Street	0	0	0	0	2	2	0	0	0	0	0	0
17:30-17:45	King's Road	Sir Harry Lauder Road	0	0	0	0	2	2	0	0	1	1	0	0
17:30-17:45	King's Road	Inchview Terrace/Portobello Road	1	1	0	0	2	2	0	0	0	0	0	0
17:30-17:45	Portobello High Street	Seafield Road East	1	4	3	1.9	40	49	9	1.35	4	0	-4	2.83
17:30-17:45	Portobello High Street	King's Road	0	0	0	0	1	0	-1	1.41	0	0	0	0
17:30-17:45	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	17	22	5	1.13	0	2	2	2
17:30-17:45	Portobello High Street	Inchview Terrace/Portobello Road	2	0	-2	2	49	32	-17	2.67	5	8	3	1.18
17:30-17:45	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	141	143	2	0.17	6	6	0	0
17:30-17:45	Sir Harry Lauder Road	King's Road	0	0	0	0	4	4	0	0	1	1	0	0
17:30-17:45	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	40	38	-2	0.32	2	1	-1	0.82
17:30-17:45	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	105	105	0	0	9	9	0	0
17:30-17:45	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	6	6	0	0	2	2	0	0
17:30-17:45	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
17:30-17:45	Inchview Terrace/Portobello Road	Portobello High Street	1	1	0	0	87	83	-4	0.43	8	8	0	0
17:30-17:45	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	96	93	-3	0.31	7	7	0	0
17:30-17:45	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Seafield Road East	Portobello High Street	0	0	0	0	68	65	-3	0.37	13	12	-1	0.28
17:45-18:00	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	170	163	-7	0.54	15	14	-1	0.26
17:45-18:00	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	7	6	-1	0.39	1	1	0	0
17:45-18:00	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	King's Road	Portobello High Street	0	0	0	0	2	2	0	0	0	0	0	0
17:45-18:00	King's Road	Sir Harry Lauder Road	0	0	0	0	2	2	0	0	0	0	0	0
17:45-18:00	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	3	3	0	0	0	0	0	0
17:45-18:00	Portobello High Street	Seafield Road East	0	1	1	1.41	45	33	-12	1.92	5	2	-3	1.6
17:45-18:00	Portobello High Street	King's Road	0	0	0	0	1	0	-1	1.41	0	0	0	0
17:45-18:00	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	36	12	-24	4.9	1	1	0	0
17:45-18:00	Portobello High Street	Inchview Terrace/Portobello Road	0	1	1	1.41	53	26	-27	4.3	6	4	-2	0.89
17:45-18:00	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	123	119	-4	0.36	3	3	0	0
17:45-18:00	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	49	36	-13	1.99	1	1	0	0
17:45-18:00	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	77	75	-2	0.23	9	9	0	0
17:45-18:00	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	1	1	0	0	1	1	0	0
17:45-18:00	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	2	2	0	0	0	0	0	0
17:45-18:00	Inchview Terrace/Portobello Road	Portobello High Street	3	3	0	0	70	70	0	0	7	6	-1	0.39
17:45-18:00	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	76	76	0	0	8	8	0	0
17:45-18:00	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0

Table A.7 Validation to Traffic Flows - Taxis, Cars and LGV - 17:00-18:00

Time	From	To	HGV				Bus+Coach				Cycles			
			Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH	Observed	Modelled	Difference	GEH
17:00-17:15	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Seafield Road East	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	2	2	0	0	0	0	0	0
17:00-17:15	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	1	1	0	0
17:00-17:15	Portobello High Street	Seafield Road East	1	0	-1	1.41	1	0	-1	1.41	0	0	0	0
17:00-17:15	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	1	0	-1	1.41	0	0	0	0
17:00-17:15	Portobello High Street	Inchview Terrace/Portobello Road	1	0	-1	1.41	3	4	1	0.53	0	1	1	1.41
17:00-17:15	Sir Harry Lauder Road	Seafield Road East	2	2	0	0	1	1	0	0	0	0	0	0
17:00-17:15	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	1	1	0	0	0	0	0	0
17:00-17:15	Sir Harry Lauder Road	Sir Harry Lauder Road	1	0	-1	1.41	0	0	0	0	0	0	0	0
17:00-17:15	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	1	1	0	0	0	0	0	0
17:00-17:15	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	2	2	0	0	0	0	0	0
17:00-17:15	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	1	2	1	0.82
17:00-17:15	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	4	5	1	0.47	0	0	0	0
17:00-17:15	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Seafield Road East	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Seafield Road East	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	2	2	0	0
17:15-17:30	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	1	1	0	0	0	0	0	0
17:15-17:30	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	2	2	0	0
17:15-17:30	Portobello High Street	Seafield Road East	0	1	1	1.41	0	1	1	1.41	0	0	0	0
17:15-17:30	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	0	1	1	1.41	0	0	0	0
17:15-17:30	Portobello High Street	Inchview Terrace/Portobello Road	0	0	0	0	4	2	-2	1.15	0	0	0	0
17:15-17:30	Sir Harry Lauder Road	Seafield Road East	2	2	0	0	1	1	0	0	0	0	0	0
17:15-17:30	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Sir Harry Lauder Road	Portobello High Street	0	0	0	0	1	1	0	0	0	0	0	0
17:15-17:30	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	2	2	0	0	0	0	0	0
17:15-17:30	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	3	2	-1	0.63
17:15-17:30	Inchview Terrace/Portobello Road	Portobello High Street	1	1	0	0	3	3	0	0	5	5	0	0
17:15-17:30	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	2	2	0	0	0	0	0	0	0	0	0	0
17:15-17:30	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Seafield Road East	Portobello High Street	0	0	0	0	0	0	0	0	1	1	0	0
17:30-17:45	Seafield Road East	Sir Harry Lauder Road	1	1	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	2	2	0	0	0	0	0	0
17:30-17:45	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Portobello High Street	Seafield Road East	0	0	0	0	1	0	-1	1.41	0	0	0	0
17:30-17:45	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Portobello High Street	Inchview Terrace/Portobello Road	0	0	0	0	4	3	-1	0.53	0	0	0	0
17:30-17:45	Sir Harry Lauder Road	Seafield Road East	0	0	0	0	1	1	0	0	0	0	0	0
17:30-17:45	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	4	4	0	0	0	0	0	0
17:30-17:45	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	3	4	1	0.53
17:30-17:45	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	7	7	0	0	5	5	0	0
17:30-17:45	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	1	1	0	0	0	0	0	0	0	0	0	0
17:30-17:45	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Seafield Road East	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Seafield Road East	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Seafield Road East	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Seafield Road East	Sir Harry Lauder Road	1	1	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Seafield Road East	Inchview Terrace/Portobello Road	0	0	0	0	1	1	0	0	0	0	0	0
17:45-18:00	King's Road	Seafield Road East	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	King's Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	King's Road	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	King's Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	King's Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Portobello High Street	Seafield Road East	0	0	0	0	0	0	0	0	1	0	-1	1.41
17:45-18:00	Portobello High Street	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Portobello High Street	Portobello High Street	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Portobello High Street	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Portobello High Street	Inchview Terrace/Portobello Road	0	0	0	0	5	2	-3	1.6	0	0	0	0
17:45-18:00	Sir Harry Lauder Road	Seafield Road East	3	3	0	0	1	1	0	0	0	0	0	0
17:45-18:00	Sir Harry Lauder Road	King's Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Sir Harry Lauder Road	Portobello High Street	1	1	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Sir Harry Lauder Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Sir Harry Lauder Road	Inchview Terrace/Portobello Road	0	0	0	0	1	1	0	0	0	0	0	0
17:45-18:00	Inchview Terrace/Portobello Road	Seafield Road East	0	0	0	0	2	2	0	0	0	0	0	0
17:45-18:00	Inchview Terrace/Portobello Road	King's Road	0	0	0	0	0	0	0	0	5	3	-2	1
17:45-18:00	Inchview Terrace/Portobello Road	Portobello High Street	0	0	0	0	3	2	-1	0.63	4	4	0	0
17:45-18:00	Inchview Terrace/Portobello Road	Sir Harry Lauder Road	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	Inchview Terrace/Portobello Road	Inchview Terrace/Portobello Road	0	0	0	0	0	0	0	0	0	0	0	0

Table A.8 Validation to Traffic Flows – HGV, Bus&Coach, Cycles - 17:00-18:00